DO RESTAURANTS CATER TO LOCAPOURS?
USING ZAGAT SURVEY DATA TO EXAMINE FACTORS THAT INFLUENCE WINE LIST SELECTION

A Thesis

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ABSTRACT

With the increased interest from consumers regarding purchasing local foods, there is a growing literature on the willingness-to-pay (WTP) for these goods. I provide a further expansion on the WTP for local food by exploring the adoption of local foods by intermediate consumers, namely restaurants. Using the Zagat Survey and restaurant specific data, we identify four categories of variables (reputation, features, cuisine, and wine list characteristics) that are expected to influence the availability of local New York State (NYS) wine on NYS restaurants' menu. My analysis uses two econometric models (logit and poisson models) in order to better understand which factors influence the presence and amount of NYS wines on restaurant menus. My results show that restaurant cuisine style and larger presence of American wines have a statistically significant effect on the likelihood of restaurants offering NYS wine.

BIOGRAPHICAL SKETCH

Joseph Perla graduated the University of California at Berkeley with a Bachelor of Science in Environmental Economics from the Department of Agricultural and Resource Economics. Mr. Perla received Distinctions (cum laude) and Honors for the accomplishment of an undergraduate honors research thesis. Shortly following his completion of an undergraduate degree, Mr. Perla joined the Charles H. Dyson School of Applied Economics and Management at Cornell University, focusing on agricultural economics. Mr. Perla will continue his graduate education at the University of Wisconsin at Madison in the Agricultural and Applied Economics Ph.D. program.

My thesis is dedicated to my parents, José and Blanca Perla. Without their support, I would not have completed this graduate degree or achieved continued success in academia.

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LIST OF ABBREVIATIONS

AVA – American Viticultural Area

NYC – New York City

NYS – New York State

USNY – Upstate New York

WTBL – Willingness-to-buy local

WTP – Willingness-to-Pay

LIST OF SYMBOLS

Conceptual Model

i – Individual decision maker

j – Choice set

U_{ij} – Utility of decision maker i with choice set j

V_{ij} – Indirect utility

ε_{ij} – Stochastic error term

r_i – Reputation information for decision maker i

a_i – Restaurant attributes for decision maker i

c_j – Cuisine attributes for products j

b_j – Beverage attributes for products j

Empirical Model

$WTBL_{ij}$ – Willingness-to-buy local for decision maker i with j product attributes

$\boldsymbol{\lambda}_{ik}$ – Vector of parameter for the effects of Zagat Survey ratings for decision maker i

$\mathbf{R}_{ik}$ – Independent variables for Zagat Survey ratings for decision maker i

$\boldsymbol{\gamma}_{il}$ – Vector of parameter for the effects of restaurant features for decision maker i

$\mathbf{A}_{il}$ – Independent variables for restaurant features for decision maker i

$\boldsymbol{\delta}_{jm}$ – Vector of parameter for the effects of cuisine groups for product j

$\mathbf{C}_{jm}$ – Independent variables for cuisine groups for product j

$\boldsymbol{\phi}_{jn}$ – Vector of parameter for the effects of wine list attributes for product j

$\mathbf{B}_{jn}$ – Independent variables for wine list attributes for product j

CHAPTER 1
INTRODUCTION

1.1 Motivation

The “local” food movement has captured the attention and influenced the purchasing patterns of American consumers over the past few decades (Feenstra, 1997; Allen et al., 2003; Maiser et al., 2005; Feagan, 2007; Kingslover et al., 2007; Smith and MacKinnon, 2007). Consumers have embraced the local food movement because of the many perceived benefits to health, the environment, and local communities (Kingslover et al., 2007; Smith and MacKinnon 2007). Sales in various local direct marketing channels (farmers markets, farm stands, and community-supported agriculture) have been growing substantially in recent years (Economic Research Service, 2010a). Local food sales through intermediate customers, such as schools, hospitals, grocery stores, and restaurants have also been expanding. Restaurants, in particular, offer locally produced foods, at least in part, to cater to this increased interest. In offering regional and seasonal ingredients in their cuisine that showcase locally grown produce, restaurants have demonstrated a demand for local foods.

With this study, I hope to fill a research gap in the literature with a closer examination of local food purchasing attributes for intermediate consumers. Because limited evidence exists regarding local purchasing habits in intermediate marketing channels, exploring restaurants’ demand for these products can shed new light on how these intermediate consumers define local products. I am interested in what factors lead to restaurants selecting local products. Furthermore, I hope to better understand what restaurants consider as local products since it is unclear how restaurants express local. Much like final consumers, intermediate consumers may have a varying view of what constitutes a local product. Using a combination of primary and secondary data, I will explore the characteristics that might influence a restaurant’s decision to

carry local goods. I believe this is a novel way to help define the concept of local, as I believe that restaurants can be thought of as very good proxies for representative consumers of food and beverage products. While there is no formalized definition for what constitutes a "local" product, for the purposes of this study, my initial assumption, based on the Economic Research Services' (2010a) generally acceptable understanding of local, will be that food products produced within a state can potentially be defined as "local."

The primary objective of this study is to better understand demand for locally produced foods and beverages by restaurants. Restaurants are an interesting intermediate consumer to consider because they are reflective of demand for food and beverages among final consumers. In this regard, restaurants are the quintessential consumer of food and beverages. The product I focus on is wine, and I do this for two reasons. First, food items are often comprised of many ingredients, some of which may be local and other which may not be local, causing difficulties in determining which food items can be appropriately labeled as local. Second, wine is one of the best examples to consider from a restaurant's menu because wines clearly identify their region of production.

Currently, the states on the West Coast of the United States, particularly California, Washington, and Oregon, are the most recognized domestic wine producing regions. Most other states have yet to reach the same level of notoriety as the West Coast wine regions. New York State (NYS), however, has become one of the fastest growing states to be recognized for producing top quality wine. Despite their increasing popularity and their close proximity to a major wine consuming city, New York City (NYC), NYS wines have not been as well received as other local products. While the locavore[1] food movement has inspired restaurants to focus on local and seasonal ingredients in their cuisine, local wines have not yet received the same

enthusiasm among restaurateurs (Molesworth, 2011). This is a particularly important topic in NYS that there are a huge number of restaurants in the state and that there is an emerging wine industry. Similarly to other emerging wine producing regions, much of the consumption of NYS wines occurs within the state, and regional restaurants have the capacity to play a vital role in the development of the locapour[2] NYS wine market.

The data source for this thesis is derived in part from a restaurant review website, the Zagat Survey. This data are a very rich and yet very under-utilized source of restaurant data in the United States. As a premier and well-established rating group, the Zagat Survey contains a large amount of information across a wide variety of restaurants. Zagat Survey features a standardized numerical scoring system for restaurants based on four categories: food quality, décor, service, and cost. Using The Zagat Survey allows me to draw from a source containing standardized scores across a diverse spectrum, in both price and cuisine, of restaurants. Much of the data is available electronically through the Zagat website; I also augment this data with menus collected from Zagat-rated restaurants to describe wine availability and prices.

1.2 Research Questions

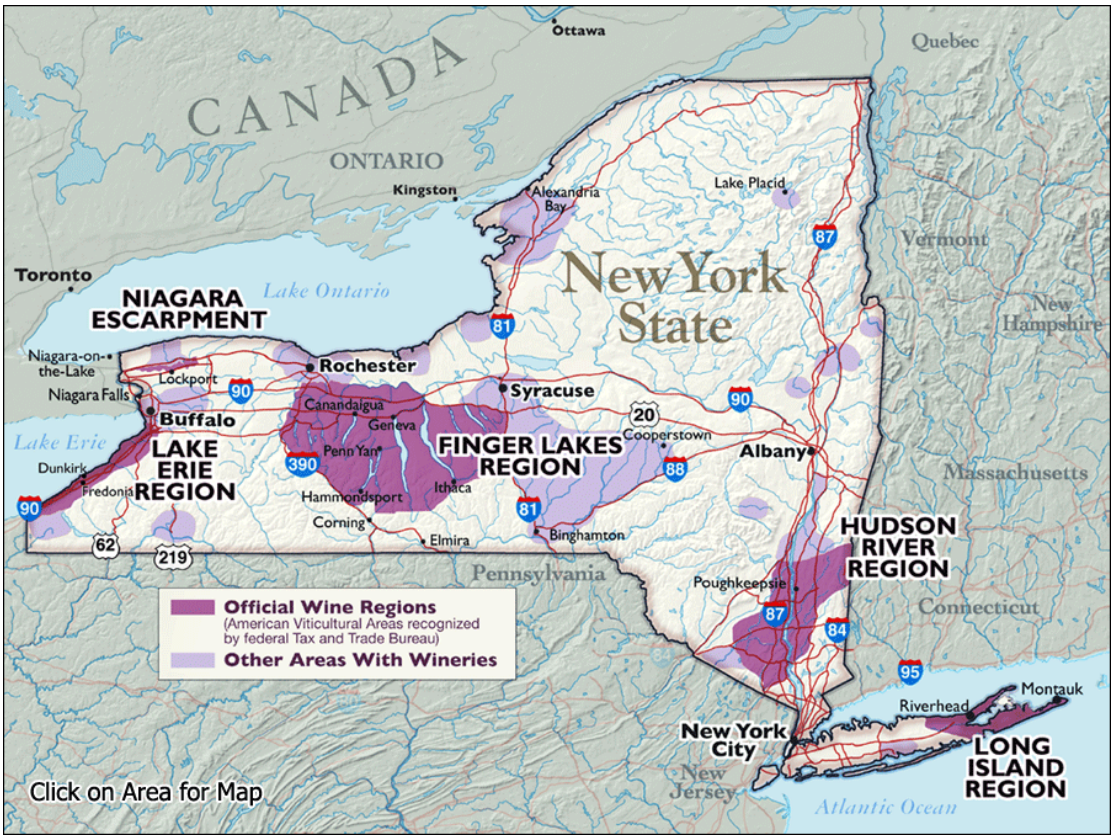
The objective of my study is to explore two aspects of the wine selection attitudes in NYS restaurants. First, I explore relationships between the availability of local wine and the variables expected to influence such availability of NYS wine. Second, I assess which of those variables can lead to an increased presence and share of NYS wine in restaurants. Since NYS has several emerging American Viticulture Areas (AVA; see Figure 1.1 for a map of NYS AVAs), exploring this idea of local, through the use of wine as a local product, will widen the general understanding of what factors drive restaurant adoption of local foods and will shed new light on the definition of local.

1.3 Thesis Outline

In order to explore the above research questions, I first begin with a literature review in Chapter Two. Specifically, I discuss studies that survey what constitutes "local" as a movement, then follow with a broad review of studies regarding final consumer attitudes toward local food, and conclude with an examination of intermediate consumer literature, focusing particularly on restaurants. In Chapter Three, I provide a breakdown of the Zagat Survey data and restaurant specific information. This chapter includes descriptive statistics for the various Zagat Survey restaurant attributes, cuisine, and location features. Also included are descriptive statistics for the restaurant specific information by wine style and production. In Chapter Four, I present an overview of the conceptual model, based on Lancaster's (1966) utility theory and random utility theory. Following the theoretical framework, I show the empirical model based on logit and poisson models and discuss the variables included in the models. Chapter Five summarizes the results from the various regressions examining the factors that affect local wine selection. This section includes analysis for full sample models, restricted sample models and a discussion comparing the results. Lastly, in Chapter Six I summarize the findings of this thesis, discuss some potential industry implications, and consider possible avenues for future research.

Figure 1.1 Map of New York State American Viticultural Areas

(Source: http://newyorkwines.org/)



CHAPTER 2
LITERATURE REVIEW

2.1 Final Consumer Demand of Local Food

The term “local food” is used to describe food that is produced locally, and this has been defined to be within a certain geographical range of where it is ultimately consumed. This somewhat ambiguous definition is due to a lack of standardized definition in the United States (ERS, 2010a). Some advocates and scholars that examine local food markets proclaim that locally produced food needs to be a system that incorporates more than simply production; they suggest it needs to involve a holistic food system which involves more elements than a conventional supply chain (Feenstra, 1997; Hinrichs, 2000 Allen et al., 2003; DuPuis and Goodman, 2008). For example, Feenstra (2002, p.100) defines local food as “a collaborative effort to build more locally based, self-reliant food economics-one in which sustainable food production, processing, distribution, and consumption [are] integrated to enhance the economic, environmental, and local health of a particular place.” Clearly, Feenstra's definition embraces many facets of local food well beyond economic production.

Economic research regarding local food has primarily focused on the willingness-to-pay (WTP) of final consumers for various types of local food products, exploring which factors of local food affect the level of WTP, and how those consumers define local food (Zepeda and Li, 2006; Darby et al., 2008; Carpio and Isengildina-Massa, 2009; Onken et al., 2011). Common discrepancies are apparent in consumer perceptions of what defines food as local. In a study by Zepeda and Leviten-Reid (2004), using focus-groups of shoppers that regularly purchase conventional and alternative food items, found that consumers general defined local food with driving time, on average about six to seven hours. This view was shared with most Caucasians in both the conventional and alternative shopper groups. A quarter of the participants gave political

boundaries as a definition for locally produced food. Zepeda and Leviten-Reid (2004) go on to state that African-Americans were the more consistent in applying a larger geographical scale to the definition of "local" than Caucasians. Both groups demonstrated support of local farmers and saw not only economic benefits but personal gains in local purchasing. Even in these small focus groups (N = 43), inconsistencies in defining local persist. In comparing marginal WTP for organic, natural and locally produced attributes across the Mid-Atlantic Region, Onken et al. (2011) found that while organic attributes lead to a price premium, the "local" attributes was not as clearly valued by consumers. The larger states in their study (Maryland, Pennsylvania, and Virginia) displayed a higher WTP when presented with a generic local moniker. Onken et al. (2011) postulates that for larger states, "local" is possibly a region smaller than political state boundaries.

In a study conducted by Darby et al. (2008), consumers did not distinguish between food produced "nearby" and food "produced in the state", placing similar value between these two concepts of local produced food. In this case, Darby et al. (2008) believes that in this case political boundaries act as a natural geographical region for defining local. As Darby et al. (2008) makes note, the discrepancy may be caused by consumers in small or mid-sized states defining "local" differently from those in larger states. Conversely, when testing five different geographical definitions of local foods, Burnnett et al. (2011) indicate that final consumer WTP increases as the geographical scale decreases (moving from a multistate region to county level). However, final consumers had a positive WTP under a generic "grown locally" label (Burnnett et al., 2011). This research suggests that final consumers are willing to pay a price premium for locally produced foods and have a varying definition of what exactly constitutes "local." While most research on final consumers is focused on WTP for local food attributes and used to

understand how final consumers define locally produced foods, those studies came to two broad conclusions on how consumers define "local": either a region smaller than state boundaries (occasionally by driving time) or political state boundaries.

2.2 Local Food as a Niche Market

Even as locally produced foods have seen an increase in sales, this raise in purchasing tends to be limited to few groups. Some studies have found that when examining final consumer participation, markets for local food have been dominated by select socio-economic groups (Kezis et al., 1998; Eastwood et al., 1999; Govindasamy et al., 2002; Wolf et al., 2005). Yet, other research has found that income was not a significant factor in local food purchasing decisions (Kolodinsky and Pelch, 1997; Onianwa et al., 2005, Zepeda and Li, 2006). Kezis et al. (1998) found that using data collected at a farmers' market in Maine, shoppers of local foods on average had higher education, higher annual income, and were older in age. Similarly, in a case study of Tennessee shoppers, Eastwood et al. (1999) estimated that average local food shopper to be a white female with some college education and above average income. In a more current study, Wolf et al. (2005) compared farmers' market shoppers to conventional shoppers in order to determine the factors which influenced a consumer's decision to patronize farmers' markets. Furthermore, Wolf et al. (2005) found that those shoppers are more likely to be college educated females. Income, age and employment, however, did not play a role in influent attending farmers markets. Moreover, a shopper's enjoyment of cooking and the perceived quality difference at farmers' markets were among the most important attributes for final consumers that attend these markets. Similar to Kezis et al. (1998), this study used survey data, but they sampled from supermarkets in order to obtain a representative sample of final consumers. Among these studies,

income and education tended to influence local food purchasing decisions; only Wolf et al. (2005) found that income did not have as strong an effect on the decision to buy local products.

Using a broader U.S survey of American shoppers (N =758), Zepeda and Li (2006) examined which final consumer attributes lead to an increase in local food purchasing from a community supported agriculture (CSA) group. They found that those consumers who "enjoy cooking" were 50% more likely to buy locally produced foods. Energy use, nutrition, and prices were not found to be statistically significant in this study. Zepeda and Li (2006) also determined that income and other demographic variables are not significant in affecting local food purchasing, but those final consumers with the highest quintile of income were less likely to buy locally sourced produce. Consumers in the lowest quintile of income were underrepresented in this study, which could explain the lack of significance in demographic characteristic and income. This contrasting evidence in the literature on the role of income on local food purchasing patterns could be due to regional differences; most of these studies were conducted across different regions in the United State (excluding the national data used by Zepeda and Li [2006]). Another explanation could be that those final consumers in the lowest income group are not represented in the surveys, and that income many be a barrier for those individuals to participate in such surveys. Overall, there may be a limited scope to which final consumer demographics impact local food purchasing patterns.

2.3 Intermediate Consumer Demand of Local Food

While final consumers have been greatly examined in the literature, little attention has been directed toward intermediate consumers' (e.g. hospitals, schools, and restaurants) attitudes toward local food. Those studies involving intermediate consumers have ranged from definitions of local (Dunne et al., 2010), exploring supply chains of farm-to-institution interactions (Feenstra

et al., 2011), and marketing local produce to colleges and teaching hospitals (Hardesty, 2008). While final consumers have expressed food products within state boundaries as local food, grocery stores have expressed food miles as their measurement of local food. Dunne et al. (2010) conducted a survey of 27 grocery stores located in the Willamette Valley, Oregon in order to understand how these intermediate consumers define "local." They found that not only did these retailers view local foods differently across stores but differently from final consumers as well. Overall, grocery stores measure local food as coming from a larger region that may include many states. Dunne et al. (2010) note that for these retail stores, food products produced within a range of 100 to 400 miles are considered local. Therefore, understanding consumer and retailer notions of local food can allow for more rigorous definitions of local food systems.

In a different aspect of exploring intermediate consumer linkages to local foods, there have been a number of studies assessing the economic feasibility of local producers providing food to institutional consumers (Strohbehn and Gregoire, 2005; Hardesty, 2008; Feenstra et al., 2011; Jablonski et al., 2011; Martin et al., 2012). Hardesty (2008), interested in local food expansion to consumers outside of direct marketing channels (e.g. farmers' markets), investigated the prospect of marketing locally grown produce to universities and teaching hospitals. Using a survey conducted in 2007 of 99 food service managers from California colleges and teaching hospitals, Hardesty (2008) determined these consumers incurred significant transaction costs and they paid a price premium to purchase local food. The decision to make of local food purchases was not driven by the clientele but by the food service directors, because of the perceived benefits (e.g. environmental and social benefit) offered by locally grown products. For those institutional consumers, transaction costs remained barriers for further increases in local food purchases. In a supply chain analysis of farm-to-institution programs by

Feenstra et al. (2011), educational institutions were found again to be willing to have multiple vendors for both local and conventional food buying. These consumers were also found to be willing to pay a price premium for attributes associated with locally grown food. Although these institutional consumers still face a number of costs associated with local food adoption, there remains a willingness to buy local foods, based on both an internal interest and client demand.

2.4 Understanding the Role of Restaurants in Local Food Purchasing

Restaurants, like other intermediate consumers, have also been the subject of few studies examining local purchasing patterns. Those studies which have explored restaurant demand for local food have conducted case studies (Strohbehn and Gregoire, 2003), examined restaurant supply chains (Starr et al., 2003; Sharma et al., 2012), or have small sample sizes (Preszler and Schmit, 2009). Those studies that do measure WTP or examine the determinantes for local food adoption in restaurants have focused exclusively on using survey and interview methodologies to obtain primarily restaurant information (Gultek et al., 2005; Inwood et al., 2009; Preszler and Schmit, 2009; Reynolds-Allie and Fields, 2011; Reynolds-Allie and Fields, 2012). In a case study by Strohbehn and Gregoire (2003), nine intermediate consumers in Iowa (restaurants and institutional consumers) were found to have a strong interest in knowing the sources of their food purchases. Perceived freshness of produce and support of local farmers further motived interest in local sourced produce. These consumers were, however, concerned with a number of logistical issues associated with local produced food (e.g. working with multiple vendors and obtaining adequate supplies). Starr et al. (2003) and Sharma et al. (2012) further substantiated these motivating factors and concerns. When investigating procurement practices between farmers and restaurants in Colorado, Starr et al. (2003) established purchases were driven by support for local business and minimizing environmental impact as drivers for local food adoption. Similarly,

Sharma et al., using a qualitative approach, determined that independently owned restaurants were more likely to showcase local products and market those products to their patrons (i.e. the use of additional menu information).

When determining restaurant purchasing patterns of local food, similar motivations have been found when exploring supply chain linkages. In a survey of 71 chefs and restaurateurs in Ohio, Inwood et al. (2009) determined that taste was the most important reason for purchasing local foods. Furthermore, high volume restaurants (i.e. restaurants with a large cliental turn-over rate) promoted and educated patrons about local food. Conversely, concerns about supply consistency and time constraints continue to limit adoption of locally produced food by those restaurants. In another study by Gultek et al. (2005), restaurateurs' attitudes toward local wine was measured directly. They conducted a mail survey from 112 restaurants which had alcohol beverage licenses in Texas. Gultek et al. (2005) found positive attitudes between local wines purchases, and taste, design (attractiveness of the bottle), and brand characteristics. Of note is that price was not a significant factor in the decision to procure local wine. Using a choice based approach for examining factors that restaurants look for in purchasing local food, Reynolds-Allie and Fields (2012) surveyed 104 restaurants and found that restaurants obtained a majority of their local produce through direct marketing channels. Still, only 18% of total weekly purchases were from local sources. Again, these consumers are interested in obtaining the freshest produce, preferring "natural" grown food over both organic and conventional farming practices when purchasing local produce.

Preszler and Schmit (2009) is a study which most closely examines this research because of the similarity in research location. In this study, Preszler and Schmit (2009) survey upscale restaurants in NYC and focus on estimating the restaurant attributes which lead to a increased

selection of NYS wine in those restaurants. Using a survey of 40 upscale urban restaurants, they found that restaurants' selection of similar varieties of wine produced in NYS (e.g. Riesling and Cabernet Franc) leads to an increased probability of restaurant purchasing NYS wine. Also, Preszler and Schmit (2009) determined that a the presence of more domestic wine portion increases the likelihood of local wine adoption. Conversely, higher entrée prices decreased local wine purchases while cuisine type did not influence on the adoption of local wine. The lack of influence from the restaurant cuisine type is an interesting outcome given that restaurants have been shown to select wines predominately for food pairing (Sirieix et al., 2011).

2.5 Contributions in understanding Restaurant Attributes that Influence presence of local products

Overall, previous research on the linkages between consumers and local foods has looked at determinants of demand by final and intermediate consumers. While research on final consumers has been greatly explored, institutional consumers and in particular restaurants have not been as well investigated. I think that restaurants are an interesting intermediate consumer to consider, as they are expected to be reflective of demand for food and beverage among final consumers (Gultek et al., 2005; Inwood et al., 2009; Preszler and Schmit, 2009; Sharma et al., 2012). With restaurants accounting for more than 70% of total food expenditure away from the home (ERS, 2010b), restaurants can be thought of as the quintessential consumers of food and beverages and have the potential for developing a larger market share for local wineries.

The contrasting evidence in the literature on the role of income on consumers' willingness to buy local food could be due to regional differences, product availability, or problems with survey instruments. Here I attempt to circumvent some of these issues by

focusing on restaurants across various price points, and I use data from an existing survey to avoid the common problems associated with conducting telephone and mailed surveys.

The next chapter describes the data collected and used in the analysis. The sample is drawn from restaurants included in the 2012 Zagat Survey database. I use this database to identify specific restaurant characteristics, reputation, and location information. These data are further supplemented with restaurant specific data regarding food and beverage menu items. The combined data set offers a unique opportunity to study the determinants of local wine demand for restaurants in NYS.

CHAPTER 3
Zagat Survey and Restaurant Specific Data

3.1 Zagat Survey Data

Currently there is no secondary restaurant data available at the state level that can be used to estimate which restaurant attributes that impact the probability of buying local wine. Internet restaurant review web sites, however, can be used to overcome this lack of data. Over the past two decades, consumer review web sites have grown in popularity. Consumer review sites such as Yelp, Trip Advisor, and the Zagat Survey are all possible sources of data that describe restaurant reputation and restaurant characteristic information. Because of various advantages (e.g. rating system and restaurant characteristics) over other restaurant rating web sites, I have drawn my data from the Zagat Survey.

The Zagat Survey is a unique online restaurant rating system. Restaurants that receive enough consumer interest are added to a "survey" [3]; once a survey is opened by the Zagat editors for a particular restaurant, Zagat Survey members[4] (final consumers) can rate it. Zagat editors then compile the reviews and provide a "Zagat Rated" review (See Figure 3.1 for a screen capture of a Zagat Rated Restaurant). This review system offers a primary advantage over competing ratings websites because the ratings are not simply averaged across all reviews. Zagat Survey does allow for member rated restaurants[5], but they are not Zagat Rated until they have been included in a survey. In order for a restaurant to be included into a survey, they must submit their information to Zagat Survey. Thus, the surveys used for compiling restaurant reviews allow for a more rigorous rating system.

NYS restaurant data was compiled during 2012 from the Zagat Survey website. Initially, this listing consisted of 5,111 restaurants. As shown in Table 3.1, 1,140 of these restaurants did not serve wine by the bottle, and 2,441 restaurants did not provide a wine list on the internet or

clearly state if they sold alcohol (Table 3.1). Narrowing the sample to only those restaurants that served wine and provided their wine list online reduced the sample to 1,530 restaurants. Figure 3.2 provides a map of restaurants across NYS which are in the sample. Zagat Survey data includes information on a number of restaurant characteristics (e.g. the Zagat ratings discussed above, cuisine type, address, restaurant features, and types of meals served). The Zagat Survey data was augmented with wine list information that included the type of wine, cost, and region of origin for 375ml bottles and larger. I did not include information regarding wine by the glass because this serving style does not represent the full list of wines available on a menu.

3.2 Zagat Rating Descriptive Statistics

The rating for a restaurant on the Zagat Survey is broken into four categories: food quality, décor, service, and average cost per meal. The first three categories are based on a 0 to 30 point scale, while the cost is based on the average cost for a single meal, drink, and tip. The ratings scores for food quality, décor, and service are stratified in five sections, ranging from "Poor to fair" (0-10) in the first group to "Extraordinary to Perfection" (26-30) in the fifth group (see Table 3.1). The average cost per meal is also divided into four groups (Inexpensive, Moderate, Expensive, and Very Expensive; see Table 3.2). Cost can also have a temporary price indicator if an average value is not available or cannot initially be formed.[6] Having a 30 point scale from the Zagat Survey rather than the more familiar five star scale has the advantage of providing more variation in ratings and allows for a more robust measure of a restaurant's reputation.

The average Zagat Survey food quality rating is 21.8 points, placing into the "very good to excellent" (21-25) category with a minimum and maximum score of 12 and 29, respectively (see Table 3.3). Average décor score is at the higher end of the "good to very good" group (16-

20) with 18.9 points. The minimum and maximum also displays a large range, between 6 and 28. Similar to the Zagat Food Quality rating, the Zagat Service score has an average of 20.4 points ("good to very good") and the same range as the food quality rating (12 to 29 points). Lastly, the average cost per meal in the sample is $46.15, labeled as "expensive" according the Table 3.1, with a minimum price of $13 and a maximum of $585. From Table 5.1 and on, the number of observations varies because some restaurants in the sample do not have a complete set of scores or price. As noted above, when a consensus cannot be determined on either the scores or average cost per meal, the scores are left blank for food quality, décor, and service, while an estimated value may be used for the cost. (see Table 3.3).

3.3 Zagat Features Descriptive Statistics

The Zagat Survey contains objective restaurant characteristics across all restaurants. The features range from descriptions of scenery (e.g. canal, ocean, lake views, etc.) to extra amenities offered by the restaurant (e.g. dancing, live music, fire pit, patio, etc.). This allows us have consistent indicators for the heterogeneous mixture of restaurants. In all, there are 44 different features a restaurant can have on the Zagat Survey. Table 3.4 contains a list of restaurant features taken from the sample. The average number of features for restaurants in my sample is 2.78, with a range of 0 to 11 (See Table 3.4). I am most interested in two features: "natural/organic ingredients" and "winning wine list." I found that 16.5% of restaurants have the natural/organic ingredients feature, and 8.6% have the winning wine list feature (Table 3.4). The "natural/organic ingredients" feature might be viewed as a proxy for local products if local foods are more likely to be made from natural or organic ingredients. If a restaurant uses organic ingredients for their cuisine, this may indicate that they place more attention on their menus, leading, perhaps, to an increased restaurants' demand for local wines. Because I am examining

local wine purchasing, a winning wine list may signal a restaurant's selection process. One possible effect could be a decrease in the probability of buying local wine because a winning wine list may consist of only those wines which are most highly rated which may or may not include NYS wine. Conversely, if the award is given not only for highly rated wines, but also for the diversity of wines offered, there may be a greater probability of that restaurant buying local wines.

Another important Zagat Survey descriptor is the type of cuisine a restaurant serves. Previous research indicates that restaurants have a high preference to serve wines which complement the type of cuisine they serve and the type of dining experience they want to convey to their clients (Davis and Charters, 2006; Gultek et al., 2005; Sirieix et al., 2011). In total, the Zagat Survey has 132 different cuisine types. To simplify my model, the different cuisine types were aggregated into six cuisine groups based primarily on regional orientation: Standard American, New American, European, Asian, Latin American, and Other cuisine. Each restaurant was categorized by cuisine grouping based on their primary cuisine type (i.e. restaurants often list with multiple cuisine types). Table 3.5 displays how each cuisine style is categorized into their respective groups. The largest cuisine category is European group with 593 observations. The second largest groups are Standard American (N = 362) and New American (N = 286) groups, followed by Asian cuisine, Other cuisine, and, lastly, Latin American cuisine. The two American cuisine styles comprise roughly 49% of the total sample.

3.4 Restaurant Specific Wine List Data

The Zagat Survey data for 1,530 restaurants was augmented with food and alcoholic beverage (both beer and wine) menu information collected from the restaurant's menus posted on individual restaurant websites. These included: the number of entrees offered, the number and

types of beers available, and detailed information on wine types, cost, and region of origin for all wine bottles (750 ml and larger) listed on the menu. The wine styles were categorized into six categories by white, red, sparkling/champagne, rosé, dessert, and fortified wine. I further separated each wine type by its production region. Wines produced in the United States were separated into four groups: California wines, West Coast non-California wines (Oregon and Washington State primarily), NYS wines, and non-NYS East Coast wines. International wines were grouped not by country but by more general production regions: Europe, Latin America, Africa, and Australia/New Zealand, and all other regions. All of the wine categories include average bottle prices and counts.

3.5 Total Wine Counts Descriptive Statistics

When exploring the average count of wine for each production region, European and Californian wines had the largest share of wines on restaurant menus on average (Table 3.6). On average, California wines, of all styles, have 22.4% share. European wines' share is three times larger at 67.8%. In total, wine from these two regions, on average, comprise 90% of a given wine list. West Coast (excluding California), Latin American, and Australian/New Zealand wine each compose roughly 2.6%. NYS wines, on average, make up 1.5% of a NYS restaurant's wine list. Lastly, both African and East Coast wines (excluding NYS) each have less than 0.5% share of a given wine list on average. The percentage share of wines from each wine region provides a better understanding of the competitive environment that local wines face in NYS.

Comparing these descriptive statistics from the study conducted by Preszler and Schmit (2009) on wine purchasing decisions in upscale NYC restaurants shows a similar pattern of how regional wine shares are structured. California wines dominate the domestic section of wine lists, and more than 60% of the wine list selection is imported. European wines occupy the largest

share of imported wine in Preszler and Schmit (2009). It should be noted that a direct percent comparison cannot be made since Preszler and Schmit sample only included 750ml bottles, while this study includes both smaller and larger bottles (although the vast majority of wines studied here were also 750ml bottles). The share of NYS wine, however, remains consistent with Preszler and Schmit (2009), showing that local wine comprised a significantly smaller selection than other domestic and European wines.

3.6 White, Red, and Champagne/Sparkling Wine Descriptive Statistics

Tables 3.7, 3.8, and 3.9 show the summary statistics for the prices and quantities of white, red, and champagne/sparkling wines from selected regions. The mean price for white wines is highest for wines from Europe and the Other region, at $58.11 and $60.96, followed closely by California, and the lowest coming from the Latin American region at $35.55 (Table 3.7). Other white wine has a higher mean price because there are few restaurants carrying these wines (N =112) than those from more established production regions (N = 989 for California and N = 1275 from Europe). The minimum and maximum price in a restaurant is, however, greater for both California and European white wine. The minimum price for both regions is roughly $10, and the maximum is $410.33. In the sample, NYS whites have a mean price of $41.83, placing those local wines in the middle of the price range for all the regions. The average number of NYS white wines per restaurant menu is 2.73 bottles or about a third less than California varietals but more than other West Coast wines. Of note is that East Coast wines (excluding NYS) have a slightly higher mean price at $51.03 than NYS whites, but this is again due to less variance in restaurants offering these wines.

The pattern seen in white wine selection is similar for red wines, with European and California reds having the highest mean prices, $101.61 and $89.60 respectively, and Latin

American wines with the lowest mean price (see Table 3.8). The average price for NYS red wine is $52.57 per bottle, listing just above the mean price of Latin American reds. Moreover, in the sample, NYS have the lowest average number of red wines per restaurant, 3.03 bottles. It should be noted that this is a higher average number than NYS white wines with similarly sized observations. The only region with a smaller average number of red wines is Africa.

Sparkling wines display a slightly different set of summary statistics. Here, the mean price for NYS sparkling wine is relatively higher, $59.04, and higher than the average price for sparkling wines from California (see Table 3.9). The range of price, however, is narrower, between $16 and $120, and the number of offerings is smaller than for those from California of Europe (about a fourth less restaurants offer NYS sparkling compared to California). When comparing the highest and lowest prices, again, European sparkling is the largest, $114.27, and Latin American sparkling wines the smallest, $40.89 per bottle. By comparing NYS white, red, and sparkling wine, a pattern emerges; as the mean price increases, moving from white wine to sparkling wine, the price range narrows and the number of offerings also decreases.

3.7 Rosé, Dessert, and Fortified Wines Descriptive Statistics

Because rosé, dessert, and fortified wines each have fewer observations, I decided to group these styles separately from white, red, and sparkling. The summary statistics for rosé wine has a much tighter price range across the various regions (see Table 3.10). The lowest average price for rosé wine comes from Africa, $35.19, with California and NYS rosé wines possessing slightly higher mean prices, $40.58 and $40.46 respectively. In the sample, Latin American rosé wine has the largest average number of bottles per restaurant followed by European rosé. Rosé wine from the other regions, California, West Coast (excluding California), NYS, Australia, and Africa each have roughly on average one bottle per restaurant. It should be

noted that California and European rosé wine have the largest observations of all the regions (N = 126 and N = 493 respectively).

The summary statistics for dessert wines follows that pattern established by the white wine varietal. Here, Other dessert wines have the highest mean price at $177.09, followed by European, $167.43, and Californian with $101.68. Similar to white wines, dessert wine from Other region has much fewer offerings than either Californian and European, but still has a wide mean price range. Latin American dessert wine possesses the lowest average price, $59.33, with NYS dessert wine costing slightly more on average, $66.88. Lastly, while most the regions have a low average number of dessert wine present on a wine list, European dessert wines, on average, appear about eight times as often as the other production regions.

Because fortified wines were usually categorized as sherry or port wine on wine lists, the only significant production region is Europe. Sherry wine is a style which predominately originates from Spain, and port wines are produced exclusively in Portugal. Only one restaurant in my sample had a NYS fortified wine and the price was $35.

In the following chapter, I outline the framework used to analyze the Zagat Survey data and the restaurant specific menu information, and to estimate which determinants influence restaurants' demand for local wine. To summarize, data is used from 1,400 restaurants that serve wine (from any production region) in NYS and contain a full set of Zagat Survey ratings and online wine list. The model uses reputation (Zagat ratings), restaurant attributes (Zagat features, cuisine, and restaurant's location), and characteristics about the wine menu to determine the impact on local wine adoption.

Figure 3.1 Screen Capture of Zagat Survey Restaurant Web Page

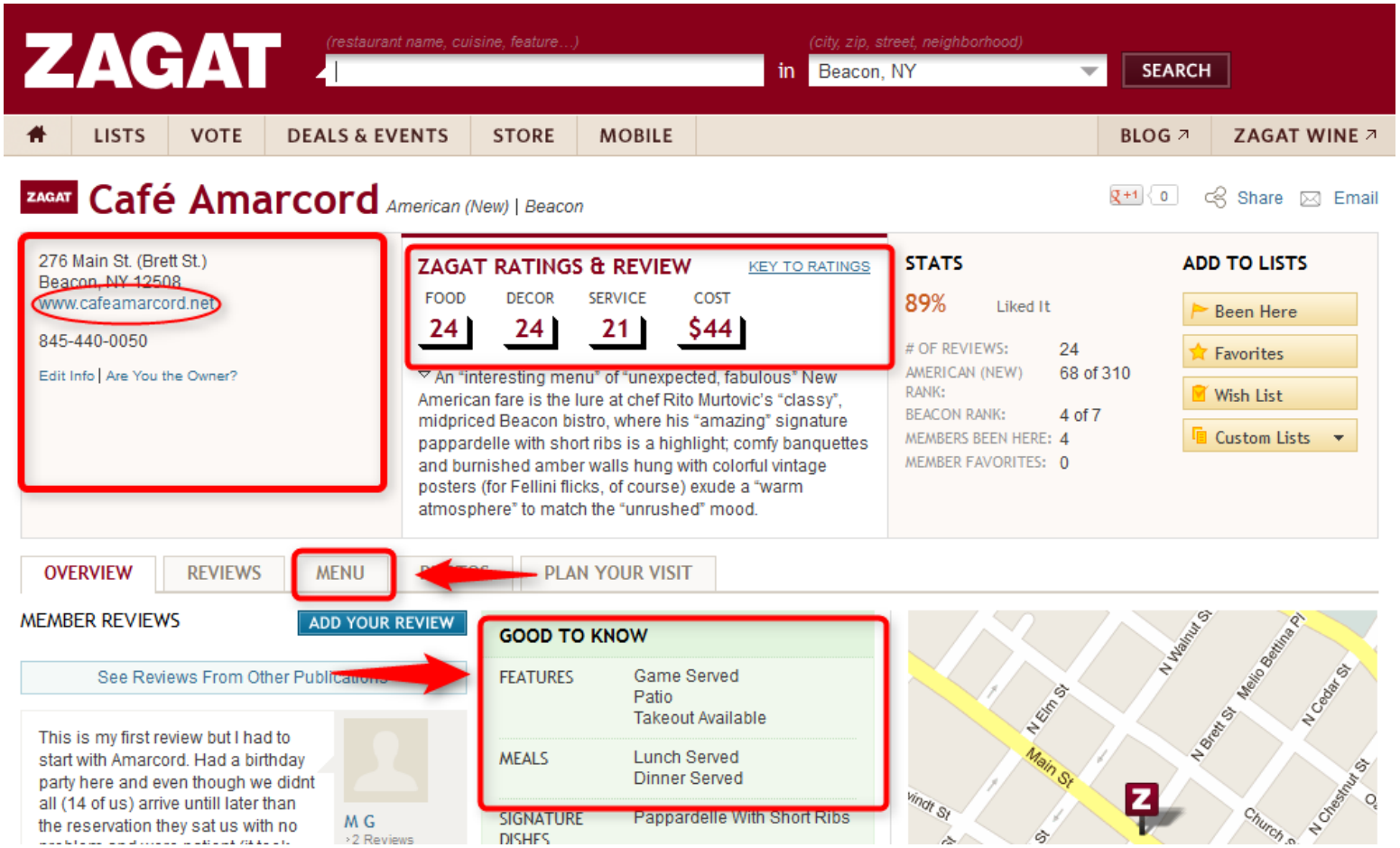


Figure 3.2 Restaurant locations from our sample in the Zagat Survey for NYS

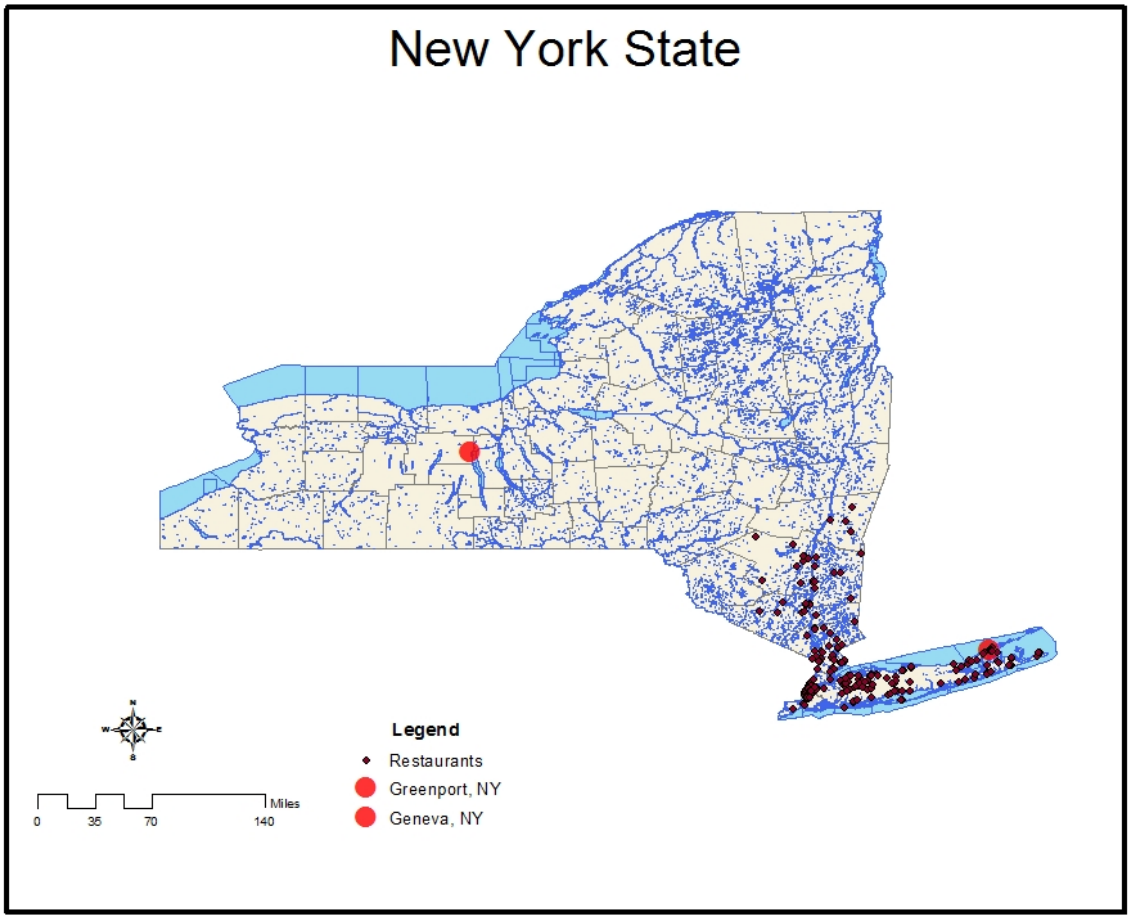


Table 3.1 Summary statistics for Restaurant Data

General Wine Menu Information	Obs.
Total Number of Restaurants on Zagat Survey from Jan 2012	5,111
Number of Restaurants without an On-line Wine Menu	2,441
Number of Restaurants which do not Serve Wine	1,140
Number of Restaurants which Serve Wine	1,530
Number of Restaurants which Serve NYS Wine	491

Table 3.2 Zagat Survey Rating Breakdown

Score Range	Description
Food Quality, Décor, and Service Ratings [a]	
26 - 30	Extraordinary to Perfection
21 - 25	Very Good to Excellent
16 - 20	Good to Very Good
11 - 15	Fair to Good
0 - 10	Poor to Fair
Cost per Meal [a,b]	
VE	Very Expensive - $51 or more
E	Expensive - $31 to 50
M	Moderate - $16 to $30
I	Inexpensive - $ 15 and below

The source for this table can be found at [a] *http://www.zagat.com/help/key-to-ratings and* [b] *Zagat Guide 2002*

Table 3.3 Average Zagat Rating Scores

Variable	Mean	Standard Deviation	Min	Max	N
Zagat Food Quality Rating	21.8	2.7	12	29	1426
Zagat Décor Rating	18.9	3.4	6	28	1425
Zagat Service Rating	20.4	2.6	12	29	1426
Zagat Cost (per meal)	$46.15	$27.38	$13.00	$585.00	1401

Note: The sample is limited to those restaurants which serve wine.

Table 3.4 Restaurant Features and Counts

Restaurant Features			
Breakfast Served	Game Served	Open 24 Hours	Takeout Available
BYO	Garden	Outdoor Seating	Terrace/Deck
Canal	Gracious Hosts	Patio	Total
Dancing	Lake/Pond	Power Scene	View
Delivery Available	Live Entertainment	Private Room Available	Waterside
Dinner Served	Lunch Served	Raw Bar	Wine List
Dramatic Interiors	Natural/Organic Ingredients	River	Winning Wine List
Family Style Portions	Ocean	Rooftop	
Fire Pit/Fireplace	Online Menu	Room Available	
Fireplace	Open Late	Sidewalk	

Count	Mean	Standard Deviation	Min	Max	N
Total Feature Count	2.78	1.59	0	11	1530
	Does not have feature (= 0)	Percent	Has feature (= 1)	Percent	N
Natural/Organic Ingredients Feature Count	1,277	83.46%	253	16.54%	1530
Winning Wine List Feature Count	1,398	91.37%	132	8.63%	1530

Note: The sample is limited to those restaurants which serve wine.

Table 3.5 Cuisine Types and Groups

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Standard American	*New American*	*European*	*Asian*	*Latin American*	*Other*
American	American (New)	Abruzzese	Asian	Argentinean	Afghan
American (Traditional)	American (Regional)	Austrian	Asian Fusion	Brazilian	African
Barbecue	Californian	Austrian (Modern)	Cantonese	Caribbean	Bakery
Cajun	Eclectic / Int'l	Basque	Chinese	Cuban	Chicken
Coffeeshop / Diner	Gastropub	Belgian	Dim Sum	Dominican	Coffeehouse
Continental		British	Hunan	Mexican	Czech
Deli		British (Modern)	Japanese	Nuevo Latino	Dessert
Diner		British (Traditional)	Korean	Pan-Latin	Egyptian
Hamburgers		Caviar	Korean Barbecue	Peruvian	Fondue
New England		Crêpes	Malaysian	Puerto Rican	Health Food
Pizza		Eastern European	Mandarin		Indian
Pub Food		Emilian	Pan-Asian		Israeli
Sandwiches		European	Polynesian		Jewish
Seafood		European (Modern)	Sichuan		Kosher/Kosher-Style
Southern		Florentine	Southeast Asian		Lebanese
Southwestern		French	Sushi		Middle Eastern
Steakhouse		French (Bistro)	Thai		Moroccan
Tex-Mex		French (Brasserie)	Tonkatsu		North African
		French (New)	Yakiniku		Pakistani
		German			Persian
		Greek			Québécois
		Italian			Russian
		Italian Northern			Serbian

Table 3.5 (continued) Cuisine Types and Groups

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6
Standard American	*New American*	*European*	*Asian*	*Latin American*	*Other*
		Italian Southern			South African
		Ligurian			Teahouse
		Mediterranean			Turkish
		Milanese			Vegan
		Neapolitan			Vegetarian
		Portuguese			
		Provence			
		Roman			
		Scandinavian			
		Sicilian			
		Small Plates			
		Spanish			
		Swiss			
		Tapas			
		Tuscan			
		Venetian			
N = 363	N = 286	N = 593	N = 118	N = 83	N = 87

Note: The sample is limited to those restaurants which serve wine.

Table 3.6 Summary Statistics of Regional Wine Counts (All Wines)

Variable	Mean	Std. Dev.	Min	Max	Percent share
Count of CA Bottles	21.10	47.71	0	793	22.4%
Count of West Coast Non-CA Bottles	2.44	5.27	0	83	2.6%
Count of New York State	1.45	4.83	0	90	1.5%
Count of East Coast Non-NY Bottles	0.18	2.12	0	66	0.2%
Count of European Bottles	63.78	161.66	0	2089	67.8%
Count of Latin American Bottles	2.41	6.48	0	141	2.6%
Count of NZ/Australian Bottles	2.34	5.63	0	117	2.5%
Count of African Bottles	0.40	1.89	0	47	0.4%
Count of all Bottles	94.11	202.71	0	2514	
N = 1,530					

Note: The sample is limited to those restaurants which serve wine.

Table 3.7 Summary Statistics for White Wine

Variable	Mean	Std. Dev.	Min	Max	Obs
California Region					
Price ($ per bottle)	$ 54.74	$ 32.35	$ 9.67	$ 411.30	989
Count White Bottle	7.57	11.38	1	216	1107
West Coast Non-CA Region					
Cost White	$ 47.42	$ 26.66	$ 16.00	$ 205.00	438
Count (number of bottles)	1.80	1.33	1	10	510
New York Region					
Price ($ per bottle)	$ 41.83	$ 12.58	$ 17.00	$ 102.54	367
Count (number of bottles)	2.73	3.56	1	38	389
East Coast Non-NY Region					
Price ($ per bottle)	$ 51.03	$ 14.09	$ 27.00	$ 95.00	38
Count (number of bottles)	2.15	3.73	1	24	40
European Region					
Price ($ per bottle)	$ 58.11	$ 55.57	$ 10.00	$ 741.29	1272
Count (number of bottles)	20.58	48.10	1	683	1415
Latin American Region					
Price ($ per bottle)	$ 35.55	$ 10.88	$ 17.00	$ 150.00	376
Count (number of bottles)	1.75	1.52	1	12	405
Australian/NZ Region					
Price ($ per bottle)	$ 44.10	$ 24.08	$ 11.00	$ 290.00	585
Count (number of bottles)	2.15	2.81	1	57	655
African Region					
Price ($ per bottle)	$ 42.16	$ 16.78	$ 19.00	$ 125.00	168
Count (number of bottles)	1.61	2.57	1	31	175
Other Region					
Price ($ per bottle)	$ 60.96	$ 57.90	$ 21.00	$ 509.00	112
Count (number of bottles)	2.21	2.21	1	16	115

Note: The sample is limited to those restaurants which serve wine.

Table 3.8 Summary Statistics for Red Wine

Variable	Mean	Std. Dev.	Min	Max	Obs
California Region					
Price ($ per bottle)	$ 89.59	$ 97.62	$ 11.00	$ 1,281.93	1019
Count (number of bottles)	20.18	43.25	1	575	1144
West Coast Non-CA Region					
Price ($ per bottle)	$ 72.90	$ 48.29	$ 20.50	$ 480.71	599
Count (number of bottles)	3.97	6.07	1	80	670
New York Region					
Price ($ per bottle)	$ 52.57	$ 28.40	$ 10.99	$ 230.00	273
Count (number of bottles)	3.03	4.58	1	44	296
East Coast Non-NY Region					
Price ($ per bottle)	$ 64.41	$ 24.22	$ 25.00	$ 120.00	26
Count (number of bottles)	5.00	13.55	1	64	28
European Region					
Price ($ per bottle)	$ 101.61	$ 154.11	$ 15.00	$ 2,278.31	1230
Count (number of bottles)	41.79	109.99	1	1317	1351
Latin American Region					
Price ($ per bottle)	$ 47.96	$ 34.35	$ 10.00	$ 420.00	772
Count (number of bottles)	3.31	7.15	1	129	862
Australian/NZ Region					
Price ($ per bottle)	$ 68.98	$ 84.02	$ 10.00	$ 775.00	574
Count (number of bottles)	3.26	5.70	1	94	656
African Region					
Price ($ per bottle)	$ 58.30	$ 34.96	$ 14.00	$ 210.00	161
Count (number of bottles)	1.73	2.02	1	24	167
Other Region					
Price ($ per bottle)	$ 78.14	$ 71.97	$ 21.00	$ 480.00	106
Count (number of bottles)	5.15	21.90	1	230	112

Note: The sample is limited to those restaurants which serve wine.

Table 3.9 Summary Statistics for Sparkling Wine

Variable	Mean	Std. Dev.	Min	Max	Obs
California Region					
Price ($ per bottle)	$ 54.23	$ 36.91	$ 12.00	$ 380.00	287
Count (number of bottles)	1.72	1.34	1	13	323
West Coast Non-CA Region					
Price ($ per bottle)	$ 59.27	$ 33.15	$ 24.00	$ 198.00	86
Count (number of bottles)	1.16	0.47	1	3	97
New York Region					
Price ($ per bottle)	$ 59.04	$ 18.46	$ 16.00	$ 120.00	67
Count (number of bottles)	1.68	1.22	1	7	71
East Coast Non-NY Region					
Price ($ per bottle)	$ 51.00	$ 8.94	$ 38.00	$ 60.00	6
Count (number of bottles)	1	0	1	1	7
European Region					
Price ($ per bottle)	$ 114.27	$ 109.16	$ 18.00	$ 1,336.06	1076
Count (number of bottles)	7.31	11.84	1	221	1181
Latin American Region					
Price ($ per bottle)	$ 40.89	$ 13.66	$ 24.00	$ 75.00	20
Count (number of bottles)	1.29	0.78	1	4	21
Australian/NZ Region					
Price ($ per bottle)	$ 48.41	$ 22.50	$ 26.00	$ 125.00	19
Count (number of bottles)	1.32	0.78	1	4	22
African Region					
Price ($ per bottle)	$ 41.95	$ 18.06	$ 20.00	$ 66.00	5
Count (number of bottles)	3.8	2.95	1	8	5
Other Region					
Price ($ per bottle)	$ 59.33	$ 28.73	$ 38.00	$ 92.00	3
Count (number of bottles)	1	0	1	1	3

Note: The sample is limited to those restaurants which serve wine.

Table 3.10 Summary Statistics for Rosé Wine

Variable	Mean	Std. Dev.	Min	Max	Obs
California Region					
Price ($ per bottle)	$ 40.58	$ 24.53	$ 12.00	$ 190.00	126
Count (number of bottles)	1.28	0.53	1	3	136
West Coast Non-CA Region					
Price ($ per bottle)	$ 54.90	$ 27.79	$ 25.00	$ 125.00	21
Count (number of bottles)	1.18	0.39	1	2	22
New York Region					
Price ($ per bottle)	$ 40.46	$ 13.01	$ 25.00	$ 105.00	65
Count (number of bottles)	1.38	0.88	1	7	72
European Region					
Price ($ per bottle)	$ 54.48	$ 93.88	$ 13.95	$ 1,671.88	493
Count (number of bottles)	2.41	2.37	1	17	513
Latin American Region					
Price ($ per bottle)	$ 47.54	$ 35.32	$ 25.00	$ 180.25	19
Count (number of bottles)	3.8	6.51	1	28	20
Australian/NZ Region					
Price ($ per bottle)	$ 42.71	$ 13.73	$ 32.00	$ 65.00	7
Count (number of bottles)	1	0	1	1	7
African Region					
Price ($ per bottle)	$ 35.19	$ 13.21	$ 21.00	$ 62.00	7
Count (number of bottles)	1.29	0.76	1	3	7
Other Region					
Price ($ per bottle)	$ 51.83	$ 24.40	$ 32.00	$ 95.00	6
Count (number of bottles)	1	0	1	1	6

Note: The sample is limited to those restaurants which serve wine.

Table 3.11 Summary Statistics for Dessert Wine

Variable	Mean	Std. Dev.	Min	Max	Obs
California Region					
Price ($ per bottle)	$ 101.68	$ 61.70	$ 19.00	$ 285.00	59
Count (number of bottles)	1.81	1.27	1	7	62
West Coast Non-CA Region					
Price ($ per bottle)	$ 72.05	$ 30.58	$ 36.00	$ 125.00	14
Count (number of bottles)	1.21	0.80	1	4	14
New York Region					
Price ($ per bottle)	$ 66.88	$ 32.57	$ 11.99	$ 180.00	28
Count (number of bottles)	1.48	0.95	1	5	29
East Coast Non-NY Region					
Price ($ per bottle)	$ 110.44	$ 63.56	$ 29.00	$ 300.00	30
Count (number of bottles)	1.48	1.25	1	6	33
European Region					
Price ($ per bottle)	$ 157.63	$ 256.10	$ 16.00	$ 1,821.86	225
Count (number of bottles)	8.88	14.45	1	102	240
Latin American Region					
Price ($ per bottle)	$ 59.33	$ 23.00	$ 28.00	$ 120.00	12
Count (number of bottles)	1.25	0.87	1	4	12
Australian/NZ Region					
Price ($ per bottle)	$ 86.40	$ 76.50	$ 23.67	$ 300.00	20
Count (number of bottles)	1.52	0.81	1	4	21
African Region					
Price ($ per bottle)	$ 91.89	$ 60.16	$ 40.00	$ 230.00	11
Count (number of bottles)	1.55	1.21	1	4	11
Other Region					
Price ($ per bottle)	$ 177.09	$ 202.70	$ 45.00	$ 1,100.00	39
Count (number of bottles)	1.62	1.08	1	6	42

Note: The sample is limited to those restaurants which serve wine.

Table 3.12 Summary Statistics for Fortified Wine

Variable	Mean	Std. Dev.	Min	Max	Obs
California Region					
Price ($ per bottle)	$ 73.00	$ 31.11	$ 51.00	$ 95.00	2
Count (number of bottles)	1	0	1	1	2
New York Region					
Price ($ per bottle)	$ 35.00	$ -	$ 35.00	$ 35.00	1
Count (number of bottles)	1	0	1	1	2
European Region					
Price ($ per bottle)	$ 249.67	$ 301.73	$ 35.00	$ 2,016.05	64
Count (number of bottles)	8.59	7.62	1	28	69
Australian/NZ Region					
Price ($ per bottle)	$ 163.00	$ -	$ 163.00	$ 163.00	1
Count (number of bottles)	2	0	2	2	1

Note: The sample is limited to those restaurants which serve wine.

CHAPTER 4
METHODOLOGY

4.1 Restuarants as Consumers and Wine List Construction

Typically thought of as firms with the objective of profit maximization, restaurants are also significant consumers of resources including food, beverages, and various durable and intangible inputs. For the purposes of my study, I focus on the procurement side of the restaurant business and model restaurants as consumers with a utility maximization objective. Durable goods for restaurants may consist of real estate space (location) and furnishings. Food and beverages can be considered non-durable goods. Lastly, intangible goods are the restaurant's reputation and the general perception of their establishment among potential clients. A restaurant derives utility from their ability to attract new clients through ambiance or aesthetics (durable goods), cuisine and wine menus (non-durable goods), and client reviews (intangible goods). By developing a brand, restaurants also provide new experiences and expand client appreciation of these experiences (e.g. the dinner experience). To some degree, restaurants may use menu items to expand patron awareness of foods or beverages they would not normally purchase in a retail experience. For example, a restaurant might offer a food or drink item which may not be profitable, but provides an interesting addition to a menu and help to further develop their brand. In particular, restaurants often use this strategy when developing wine lists (Berenguer Contrí et al., 2009). After conducting a series of focus groups with wine and restaurant stakeholders, Saura, Eugenia Ruiz Molina, and Berenguer Contrí (2008) further illustrate this point that a wine list provides two functions: first, as a document that displays the contents of the restaurant's supply of wines, and, second, as a tool that communicates the restaurant's brand or philosophy concerning food and beverage preparation.

4.2 Conceptual Model

The theoretical approach adopts the framework proposed by Lancaster's (1966) consumer theory of utility. This consumer theory states that the utility derived from a good is based on the attributes or characteristics of that good (Lancaster 1966). The utility from a good can, therefore, be decomposed into this attributes, allowing a consumer to choose the bundle of characteristics that maximize his or her utility. Here I follow random utility theory, which states that an individual decision maker i has a choice set of j alternatives where $j = 1, 2, ..., J$ with each j allowing for different levels of utility, U_{ij} (Train, 2003). Because I cannot measure utility directly, U_{ij} can be broken down in to its systematic component, V_{ij}, representing the indirect utility, and a stochastic component, ε_{ij}, as shown in equation (1). The stochastic component encompasses those factors which are unobservable by either the decision maker or attributes in the product.

(1) $U_{ij} = V_{ij} + \varepsilon_{ij}$

The systematic component, V_{ij}, contains both characteristics of decision maker i and attributes from product, j. In this application, I rely on the assumption that each individual restaurant (or restaurateur) must choose those food and beverage products which complement the ex-post characteristics of the restaurant such as reputation and aesthetics (or restaurant attributes) given an individual budget constraint. As a result of this assumption, the decision makers have the goal of maximizing their utility by selecting those food and beverage products that offer the most representative experience of their restaurant. In equation (2), the systematic component, V_{ij}, is decomposed into four subcomponents. r_i and a_i are reputation information and restaurant

attributes for decision maker i, with c_j, and b_j representing cuisine and beverage attributes for products j.

(2) $V_{ij} = f(r_i, a_i; c_j, \mathrm{b}_j)$

In equation (3) I introduce the vector $\mathbf{x}_{\mathrm{ij}}$ to characterize these subcomponents of V_{ij} and $\boldsymbol{\beta}_{\mathrm{ij}}$ represents the marginal utilities of these subcomponents.

(3) $U_{ij} = \boldsymbol{\beta}_{\mathrm{ij}} \mathbf{x}_{\mathrm{ij}} + \varepsilon_{\mathrm{ij}}$

Because I am only interested in one aspect of the decision maker's problem, whether a decision maker selects for local products on their menu and the share of those local products, I could examine c_j, b_j, or both. Although cuisine would be a first choice for examining local food, there are some logistical issues. Firstly, it would be difficult to categorize local food for a whole meal, as not all the produce, meat, or grain would come from a local source. A restaurant may purchase its food from various farms, and researchers would not be able to know which items in the dish come from which farms. Such a route could be undertaken in small sample sizes, but not at the scale being considered here. Secondly, I would need to know which food items are not from "local" farms. Without having data on the share of local products, I cannot gauge those factors which increase the share of local products. I can, however, use beverages as a candidate for local products. Beverages, and wines in particular, offer a unique advantage over food because it is a single product that carries the production region on the menu and on the label, and has characteristics that are less ambiguous. Because I am interested in the presence and consumption of local products, wine lists enable me to examine the diversification and breadth of local products without having to know detailed production information about a collection of

different ingredients. Thus, restaurant decision makers look to maximize their utility by selecting those wines which will attract their targeted consumer base.

The choice set for decision makers follows that which is outlined by Train (2003). I rely on the assumption that each individual restaurant (or restaurateur) must choose those wines that complement the ex-post characteristics of the restaurant. The restaurants in this study can then select to sell local wine in any of wine category (white, red, champagne/sparkling, rosé, dessert, and fortified wines). Restaurants can have any combination of local wine, allowing the alternatives to be mutually exclusive. Following standard approaches for developing consumer choice models, I define P_{ij} as the probability that decision maker i will choose product j. Equation (4) shows that the decision maker will choose product j when their utility from product j is greater than that from an alternative product k.

(4) $P_{ij} = \text{Prob}(U_{ij} > U_{ik}, \text{ where } k \neq j)$

In essence, by selecting one alternative, the restaurant does not choose any of the other alternative combinations. For example, if a restaurant chooses to provide local white and red wines, they are choosing not to have local white wines only. Furthermore, the choice set is exhaustive since the "no local wines" as an alternative to j. Lastly, the choice set for decision makers in this study example is a finite set; the alternatives are limited to 0 if the restaurant elects not to offer any local wine and 1 if they have any combination of local wine.

A two modeling strategy is employed to examine restaurant demand for local wine, defined as willingness to buy local (WTBL). First, I use a binary logit model to assess the determinants that influence a restaurateur's decision to offer local wine. Equation (5) shows the logistic model deployed. The restrictive criterion of independence of irrelevant alternatives (IIA) is assumed to hold for this case.

$$(5)\quad P_{ij} = \frac{e^{\boldsymbol{\beta}_{ij}\mathbf{x}_{ij}}}{(1+e^{\boldsymbol{\beta}_{ij}\mathbf{x}_{ij}})}$$

Furthermore, in order to understand how restaurants select the breadth (e.g. number of local wines) I use a zero-inflated poisson (ZIP) model to measure the count of local wine, given a restaurant has selected to serve local wine. Because a large proportion of restaurants in the sample do not serve NYS wine (roughly about two-thirds do not) this model is preferred rather than other count models such as a simple poisson model or a tobit specification. The ZIP model takes a two-step approach to estimate the count as compared to a standard poisson model. First, it applies a binary process to determine the zero and the count groups, and second, when the binary process takes on the value 1, the independent variable takes on the values from the count density function. By providing results from both a logit and poisson model, I can obtain a more complete range of results that describe the impact of the four characteristics (reputation, restaurant, cuisine, and wine attributes) on the likelihood of a restaurant offering local wine.

4.3 Empirical Model

Based on the conceptual model described in the previous section, equation (6) outlines the empirical specification used to estimate a restaurant's likelihood of offering local wine. Here I estimate the restaurant decision maker's decision to offer local wine in two forms. First, in the logit model, $WTBL_{ij}$ is set equal to 1 if local wine is offered, and 0 otherwise. Second, in the ZIP model, $WTBL_{ij}$ is set equal to the number of local wine bottles offered on the menu, ranging between 0 and n. The dependent variable for decision maker with restaurant characteristics i with j cuisine and beverage attributes is denoted as $WTBL_{ij}$. The explanatory variables contained

in the model include variables which describe the restaurant's reputation ($\mathbf{R}_{ik}$), restaurant attributes ($\mathbf{A}_{il}$), cuisine type ($\mathbf{C}_{jm}$), and the wine list attributes to represent beverage category ($\mathbf{B}_{jn}$).

(6) $$WTBL_{ij} = \alpha + \boldsymbol{\lambda}_{ik}\mathbf{R}_{ik} + \boldsymbol{\gamma}_{il}\mathbf{A}_{il} + \boldsymbol{\delta}_{jm}\mathbf{C}_{jm} + \boldsymbol{\phi}_{jn}\mathbf{B}_{jn} + \varepsilon_{ij}$$

In equation (6), $\boldsymbol{\lambda}_{ik}$ is a vector of parameters containing the effects of the restaurant's reputation ($\mathbf{R}_{ik}$); this is represented by the four Zagat Survey ratings scores: Zagat Food Rating, Zagat Décor, Zagat Service rating, and Zagat Average Cost per meal. The vector of parameters describing the effect of restaurant and regional attributes is $\boldsymbol{\gamma}_{il}$. Specifically, restaurant attributes ($\mathbf{A}_{il}$) include the selected Zagat-defined features as dummy variables, determining whether a restaurant serves natural/organic ingredients, or has an award-winning wine list. In addition, $\boldsymbol{\gamma}_{il}$ includes the effects for the count of features for a given restaurant. Lastly it includes location dummy variables for restaurants in upstate New York (USNY), Manhattan, or Long Island regions. The location information is relative to the other four boroughs of New York City, referred to as the Outer Boroughs (Brooklyn, Bronx, Staten Island, and Queens).

I assume that the cuisine type, $\mathbf{C}_{jm}$, in equation (6), is another attribute of the restaurant. Because I cannot measure each dish separately per restaurant, by using the Zagat Survey I can distinguish the overall type of cuisine served. Furthermore, since wine often is selected to compliment the type of cuisine served (Gultek et al., 2005), the overall type of cuisine can be treated as a restaurant attribute. I use $\boldsymbol{\delta}_{jm}$ to represent a vector of parameters containing the effects for five dummy variables for the cuisine groups, Standard American Cuisine, European Cuisine, Asian Cuisine, Latin American Cuisine, and Other Cuisine. The omitted base case for

cuisine type is New American cuisine. Lastly I use $\boldsymbol{\phi}_{jn}$ to represent a vector of parameter which characterizes the effects of a restaurant's wine list on its demand for local wine. Wine list attributes ($\mathbf{B}_{jn}$) include the number (count) of white wine, red wine, sparkling wine, rosé wine, dessert wine, fortified wine[8], and the domestic count of wine (excluding NYS wines). Lastly, ε_{ij} is the overall error term which is assumed to follow a normal distribution with mean zero. For a full list of dependent and independent variables, see Table 4.1.

Table 4.1 Dependent and Independent Variables

Dependent Variable	
Binary NYS Wine:	1 for restaurants serving NYS wine, otherwise 0
Count of NYS Wine:	$y_i > 1$ for restaurants serving NYS wine, $y_i = 0$ otherwise

Independent Variables

Zagat Scores	***Restaurant Feature from Zagat***	***Cuisine Style from Zagat*** [a]	***Restaurant Wine List***	***Restaurant Location*** [b]
Zagat Food Score	Natural/Organic Ingredients	Standard American Style	Total Wine Count	Up State NY Location
Zagat Décor Score	Winning Wine List	European Style	Domestic Wine Count	Manhattan Location
Zagat Service Score	Feature Count	Asian Style	Regional Wine Counts (8)	Long Island Location
Zagat Cost (in $)		Latin American Style		
		Other Style		

[a] *New American is base case cuisine*

[b] *Outer boroughs of NYC (Bronx, Brooklyn, Queens, and Staten Island) is the base case location*

CHAPTER 5
RESULTS AND DISCUSSION

5.1 Full Sample Analysis: Factors Which Affect Willingness to Buy Local Wine

In this chapter I present the empirical results that estimate the availability of local wine on restaurant menus. To summarize, I am estimating restaurant demand for local wine or restaurants' willingness to buy local wine. First, the baseline results containing the full sample size are provided using a logit model and a zero-inflated poisson model. The logit model is used to estimate a restaurants' willingness to offer NYS wine and the ZIP model is also used to examine the determinants which influence the count of NYS wines present on restaurants' menus. Logit results are provided for the models that examine specific styles of local wines, namely local white, red, sparkling, rosé, and dessert wines. Lastly, results for restaurants' demand in specific locations within NYS are provided. Across all the model specifications I estimate the effects of a restaurant's reputation, including meal price (in the form of Zagat scores), cuisine groups, restaurant attributes, wine list details, and regional attributes.

Table 5.1 provides the baseline empirical results for the 1,400 restaurants in NYS that made their menus available online and had Zagat scores for all four categories (food quality, décor, service, and average cost per meal). The first column in Table 5.1 shows the results from a logit model that estimates the presence of local wines on a restaurant's menu; the associated marginal effects from that logit estimation are displayed in the second column. Overall, the logit results in Table 5.1 show that, of a restaurant's reputation, only the Zagat Décor rating is statistically significant on restaurant demand for local wine. This result indicates that restaurants with a higher décor score are more likely to offer local wines; when examining the marginal effect of décor on local wine adoption, a one point rating increase from the average score leads to a 1.4% increase in the probability of a restaurant's demand for at least one bottle of local wine.

This factor may suggest that restaurants with higher décor score pay closer attention to detail, and this additional level of detail might be correlated with crafting a wine list which, in turn, may increase restaurants' demand for local wine on their wine lists.

In the logit model, all the cuisine styles (Standard American Cuisine, European Cuisine, Asian Cuisine, Latin American Cuisine, and Other Cuisine) listed have negative and statistically significant coefficients. This indicates that restaurants with New American cuisine (the omitted group) are more likely to include local wines on their menu. Because the coefficients are more negative and the marginal effects are larger for European and Asian cuisines, restaurants with these cuisine styles may be even less likely to include local wines. In addition, of the restaurant attributes captured by Zagat Survey, the natural/organic ingredients feature and total features count are both positive and statistically significant in the analysis. This suggests that restaurants offering natural or organic foods are more likely to offer local wines; a discrete change from 0 (no feature) to 1 (has the natural/organic feature) leads a 6.9% increase in a restaurant's demand for at least one bottle of local wine.

The logit results for wine list attributes shown in Table 5.1 display some interesting patterns. The availability of local wine increases with a higher number of white, sparkling, dessert, and total domestic (excluding NYS) wine selections. Restaurant demand, however, decreases as the total number of red wines available on a wine list increases. The regional dummy variables in Table 5.1 show that restaurants in upstate NY and on Long Island are more likely to include local wines on their wine lists, relative to the outer boroughs (Bronx, Brooklyn, Staten Island, and Queens) of NYC. Below I will further examine and discuss these regional differences.

Table 5.2 provides additional baseline results for restaurants' demand for local wine in NYS. In the first column of Table 5.2, results from a ZIP model are present that estimate the count of local wines on a restaurant's wine list. The second column shows results of the same ZIP model for the share of local wine. The share is calculated by dividing the total count of NYS wine by the total number of all wines. In column one, all four Zagat scores are statistically significant; the Zagat Food Quality score and Zagat Décor score have positive coefficients while the Zagat Service score and the Zagat Cost have negative coefficients. The poisson results suggest that increases in restaurant service and increases in meal costs correlates with a lower count of NYS wines on restaurant menus. In column two, however, none of the Zagat rating scores are statistically significant coefficients. This means that restaurants' count of local wine may increase while the share of local wine on restaurants' wine lists may not be influenced by their reputation.

In Table 5.2, the estimated coefficients for the cuisine types in the poisson models generally have the same signs as those estimated in the logit model, but in the poisson model that estimates the share of local wines has fewer variables that are statistically significant of the cuisine types. The European cuisine variable is the only cuisine group which remains statistically significant and negative coefficient. This suggests that restaurants with this cuisine style may be the least likely to serve wine and have a smaller share of local wines present on their menu. The natural/organic ingredients feature, in column one, is positive and statistically significant and the total features count is negative and statistically significant. In column two, none of the restaurant attributes are statistically significant in influencing the share of local wine. This suggests that restaurants that serve natural or organic food may also increase the count of local wine. Conversely, an increase in total feature count may decrease restaurants' number of local wine.

The poisson results for wine list attributes shown in Table 5.2 show somewhat different results from those in the logit model. The count of local wine increases with a higher number of sparkling, rosé, and dessert wine selections. The results for the share of local wine, however, show that a higher count of white wine decreases the share of NYS wine. I will take a closer look at how the determinants differ for local wine across various wine styles in the section below. Results from the poisson models also show a positive and statistically significant effect for the Long Island location, but not for the upstate NY location or the Manhattan location.

5.2 Full Sample Analysis: Factors that Affect the Availability of Various Local Wine Styles

The baseline logit results display a positive effect for the availability of white wine offerings on restaurants' demand for local wine and a negative effect for the availability of red wine offerings. This result is intuitively appealing given that NYS is better known as a producer of white wines. The baseline results show a positive effect for the number of sparkling, rosé, and dessert wine offerings on restaurants' demand for local wine. Further analysis that focuses exclusively on the styles of wines may shed additional light on restaurant demand for local wine.

In the first column of Table 5.3, I replicate the original logit results from Table 5.1. The second column reports results using the presence of NYS white wines as the dependent variable, and the third column shows results using the offering of NYS red wines as the dependent variable. Many of the results for the model that focuses on white wines are similar to the baseline model. For the model that focuses on NYS red wines, the Zagat Décor score is not statistically significant, and there is a larger negative effect for restaurants serving Asian cuisine. NYS red wine shows fewer significant cuisine styles, but restaurants offering Asian cuisine have again a larger negative coefficient. The coefficient for the natural/organic ingredients feature are again positive and statistically significant for restaurants' demand for both white and red NYS wines,

but the total features count is no longer statistically significant across either local wine. Again, similarities are found between the baseline results and the presence of NYS white wine related to the wine list attributes. This similarity may be expected because NYS produces predominately white wine varietals. The availability of local white wine increases with a higher number of white, sparkling, and dessert wine selections. Total domestic (excluding NYS) has a positive effect on restaurants selecting NYS white and red wines. Restaurant demand for both white and red NYS wines also decreases as the total number of red wines available on a wine list increases, consistent with the baseline results.

The first column of Table 5.4 shows the results using the presence of NYS sparkling wines as the dependent variable, and columns two and three report results utilizing the presence of NYS rosé wine and NYS dessert wines respectively. Models for the three wine styles in Table 5.4 show varying results to one another and to the baseline results. The differences between these models and the baseline logit specification may be caused by a lower exposure or limited production of these varietals. None of the Zagat scores are significant for NYS sparkling wines. NYS rosé wine displays a positive and statistically significant coefficient for the Zagat Décor score while the Zagat Service score has a negative and statistically significant effect on restaurants' demand for local rosé wine. The availability of NYS dessert wine, meanwhile, increases with the Zagat Food Quality score. Across NYS sparkling, rosé, and dessert wine selections, European cuisine is again negatively related to restaurant offerings of these styles of local wine. Both Asian and Other cuisine groups are not included for any of these styles because neither group in the sample serves NYS sparkling, rosé, or dessert wines. This causes the sample size to decrease. Lastly, of the three wine styles, the natural/organic ingredients feature is positive and statistically significant in the analysis for NYS rosé.

In addition, Table 5.4 reports some results that are mostly in line with the baseline results. The availability of local sparkling wine increases with a higher number of rosé, dessert, and total domestic (excluding NYS) wine selections. This pattern changes slightly for NYS rosé wine. The results in Table 5.4 show that a larger number of sparkling wines and rosé wines increase restaurants' demand for local rosé wine. Similarly, results for local dessert wine change slightly and indicate that a higher number of rosé, sparkling, and fortified wines may increase the presence of NYS dessert wines on restaurant wine lists.

The most notable results in Table 5.3 and Table 5.4 are for the regional attributes. In Table 5.3, white wines are more likely to be present in upstate restaurants, while a smaller proportion white and largest proportion of red wines are more likely to be offered in Long Island restaurant, again relative to the outer boroughs. Knowing that the Long Island region produces the majority of NYS red wines as well as white wines, this result suggests that the definition of local may be quite narrowly defined by restaurant decision makers. Because there is a positive coefficient for the Long Island region in the red wine model and no similar effect for the upstate region in the red wine model, one might infer that demand for local red wine (from Long Island) diminishes outside of the Long Island region. Results in Table 5.4 may further emphasize this narrow definition. Upstate restaurants are only more likely to adopt sparkling wine, while Long Island restaurants may be more likely to offer sparkling, rosé, and dessert wine. Restaurants closer to an AVA, such as those in Long Island, may be more likely to offer a variety of local wine styles, provided the wines originate from their nearest AVA. This result suggests that defining local by state borders may be too large, and that restaurant owners use the term local to define a much smaller sub-region within a state.

5.3 Restricted Sample: Factors that Affect Willingness to Buy Local Wine by Region

In this final section of results, I use a restricted model to examine restaurants' demand for local wine in the NYC metropolitan area (Manhattan and the four boroughs that include the Bronx, Brooklyn, Staten Island, and Queens) and the upstate NY and Long Island regions. This analysis is conducted for three reasons. First, approximately two-thirds of the observations in the sample are from the NYC metropolitan area[7]. Second, many winemakers in NYS and elsewhere are keenly interested in selling their wines to restaurants in NYC and in particular Manhattan (Preszler and Schmit, 2009; Gergaud, Storchmann, and Verardi, 2012). Lastly, because determinants from restaurants' demand in upstate NY and Long Island vary, examining those areas independently may provide additional insight into local wine selection in those regions.

In Table 5.5, the first column reports logit results for the Manhattan region. Here, the coefficient on the Zagat Décor score remains positive and is statistically significant. Furthermore, the results show a negative and statistically significant effect on the Zagat Cost variable, suggesting that NYS wines are less likely to be available in Manhattan restaurants with higher average meal prices. In the second column, results for restaurants in the outer boroughs of NYC show the Zagat score for service is inversely related to the likelihood of including local wines; this suggests that more casual restaurants in this region may be more likely to offer local wines. For restaurants in Manhattan, the effects for the various cuisine types and wine menu attributes remain largely unchanged from the baseline results; restaurants with New American cuisine are more likely to include local wines on the menu, and a higher number of white wines, sparkling wines, dessert wines, and domestic wines on a menu increase the likelihood of including local wines. Again, similar to the baseline results, the coefficients for European and Asian cuisine types are more negative (and remain statistically significant) in the Manhattan

model. Other cuisine was dropped from the outer boroughs model due to the limited number of observations for this style of cuisine. For those restaurants located in Manhattan, the wine list attributes follow the same pattern as in the baseline results, and although the various wine menu attributes are not significant in the outer borough model, the total number of domestic wines offered continues to positively influence the presence of local wines.

In the last table of this chapter, Table 5.6, the first column shows the Long Island region and the second column the upstate NY area. Unlike the NYC metropolitan area, none of the Zagat scores influence local wine selection in either Long Island or upstate NY. Similar to the baseline results and those found the NYC metropolitan area, the coefficients for European and Asian cuisine groups are both negative (and more negative than those in the earlier model results) and remain statistically significant. For Long Island, the wine list attribute results follow those results from Table 5.3, reporting that higher numbers of local white wine, local red wine, and domestic wine (excluding NYS) increases restaurants' demand for NYS wine in this area, and, similar to the outer boroughs, none of the various attributes are statistically significant for restaurants located in upstate NY.

Table 5.1 Logit Regression Results and Marginal Effects

Variable	Logit Model [a]	Marginal Effects [b]
Zagat Reputation		
Zagat Food Quality Rating	0.0341	0.00692
	[0.0416]	[0.00843]
Zagat Décor Rating	0.0676**	0.0137**
	[0.0282]	[0.00569]
Zagat Service Rating	-0.0141	-0.00285
	[0.0495]	[0.0100]
Zagat Cost (per meal)	-0.00273	-0.000554
	[0.00538]	[0.00109]
Cuisine Groups [c]		
Standard American Cuisine	-0.557***	-0.105***
	[0.201]	[0.0352]
European Cuisine	-1.138***	-0.217***
	[0.188]	[0.0336]
Asian Cuisine	-1.899***	-0.250***
	[0.357]	[0.0262]
Latin American Cuisine	-0.860**	-0.143***
	[0.343]	[0.0449]
Other Cuisine	-1.194***	-0.184***
	[0.344]	[0.0372]
Restaurant Attributes		
Natural/Organic Ingredients Feature	0.324*	0.0685*
	[0.182]	[0.0400]
Winning Wine List Feature	0.0539	0.011
	[0.270]	[0.0558]
Total Feature Count [d]	0.0826*	0.0168*
	[0.0448]	[0.00910]
Wine Menu Attributes [e]		
Total Count of White Wine	0.0104***	0.00212***
	[0.00374]	[0.000763]
Total Count of Red Wine	-0.00888***	-0.00180***
	[0.00189]	[0.000388]
Total Count of Sparkling Wine	0.0245*	0.00496*
	[0.0131]	[0.00265]
Total Count of Rosé Wine	-0.0143	-0.00289
	[0.0395]	[0.00801]
Total Count of Dessert Wine	0.0520**	0.0105**
	[0.0227]	[0.00462]

Table 5.1 (continued) Logit Regression Results and Marginal Effects

Variable	**Logit Model** [a]	**Marginal Effects** [b]
Total Count of Fortified Wine	0.015	0.00305
	[0.0459]	[0.00932]
Total Domestic Count	0.0211***	0.00428***
	[0.00356]	[0.000738]
Regional Attributes [f]		
Upstate New York Location	0.452*	0.0976*
	[0.259]	[0.0587]
Manhattan Location	-0.186	-0.0379
	[0.226]	[0.0462]
Long Island Location	0.980***	0.220***
	[0.246]	[0.0583]
Constant	-2.638***	
	[0.780]	
Log Likelihood Ratio	-685.91	
Observations	1,400	1,400

[a] *The dependent variable in the logit model is the willingness to buy local and equals 1 if the restaurant serves any NYS wine and 0 otherwise.*

[b] *The marginal effects is for the discrete change of the dummy variable from 0 to 1.*

[c] *Cuisine groups are related to the base case of New American Cuisine.*

[d] *This category does not include the Natural/Organic Ingredients special feature or the Winning Wine List special feature.*

[e] *The counts of wine do not include NYS wines.*

[f] *The regional attributes are related to the base case of the outer boroughs (Bronx, Brooklyn, Staten Island, Queens).*

*Note: Standard errors are in brackets where *** p<0.01, ** p<0.05, * p<0.1.*

Table 5.2 Zero-inflated Poisson Regression Results for Count of NYS Wine and ZIP Regression Results for Share of NYS Wine

Variable	**ZIP Model** [a]	**ZIP Model for Share** [b]
Zagat Reputation		
Zagat Food Quality Rating	0.0484***	-0.0142
	[0.0172]	[0.100]
Zagat Décor Rating	0.0685***	0.00162
	[0.0107]	[0.0701]
Zagat Service Rating	-0.0550***	-0.0546
	[0.0196]	[0.123]
Zagat Cost (per meal)	-0.0109***	0.00286
	[0.00193]	[0.0111]
Cuisine Groups [c]		
Standard American Cuisine	-0.0771	-0.100
	[0.0669]	[0.435]
European Cuisine	-0.188**	-1.419**
	[0.0732]	[0.560]
Asian Cuisine	-1.459***	-2.201
	[0.427]	[1.406]
Latin American Cuisine	0.494***	-0.221
	[0.124]	[0.748]
Other Cuisine	-0.536***	-1.185
	[0.200]	[1.047]
Restaurant Attributes		
Natural/Organic Ingredients Feature	0.703***	0.580
	[0.0573]	[0.411]
Winning Wine List Feature	0.0653	-0.127
	[0.0722]	[0.804]
Total Feature Count [d]	-0.0117	-0.0533
	[0.0163]	[0.109]
Wine Menu Attributes [e]		
Total Count of White Wine	0.000461	-0.0174
	[0.000766]	[0.0206]
Total Count of Red Wine	-0.000475	-0.00157
	[0.000477]	[0.00918]
Total Count of Sparkling Wine	0.00762*	0.00340
	[0.00417]	[0.0563]
Total Count of Rosé Wine	0.0513***	0.00774
	[0.0124]	[0.115]

Table 5.2 (continued) Zero-inflated Poisson Regression Results for Count of NYS Wine and ZIP Regression Results for Share of NYS Wine

Variable	**ZIP Model** [a]	**ZIP Model for Share** [b]
Total Count of Dessert Wine	0.0121***	0.0669
	[0.00374]	[0.0586]
Total Count of Fortified Wine	0.00816	0.0260
	[0.00765]	[0.145]
Total Domestic Count	0.000672	-0.00464
	[0.000748]	[0.0136]
Regional Attributes [f]		
Upstate New York Location	-0.0102	0.324
	[0.110]	[0.659]
Manhattan Location	-0.0373	-0.425
	[0.104]	[0.612]
Long Island Location	1.002***	1.138**
	[0.0980]	[0.572]
Constant	-0.0273	-1.683
	[0.300]	[1.853]
Log Likelihood Ratio	-92.38	-133.90
Observations	1,400	1,400

[a] *The dependent variable in the poisson model is the count of local (NYS) wines.*

[b] *The dependent variable in the poisson model is the share of local (NYS) wines.*

[c] *Cuisine groups are related to the base case of New American Cuisine.*

[d] *This category does not include the Natural/Organic Ingredients special feature or the Winning Wine List special feature.*

[e] *The counts of wine do not include NYS wines.*

[f] *The regional attributes are related to the base case of the outer boroughs (Bronx, Brooklyn, Staten Island, Queens).*

*Note: Standard errors are in brackets where *** p<0.01, ** p<0.05, * p<0.1.*

Table 5.3 Logit Regression Results for All NYS Wine, NYS White Wine, and Red NYS Wine

Variable	All NYS Wines [a]	White NYS Wine [b]	Red NYS Wines [c]
Zagat Reputation			
Zagat Food Quality Rating	0.0341	0.000741	-0.0101
	[0.0416]	[0.0436]	[0.0495]
Zagat Décor Rating	0.0676**	0.0682**	0.0517
	[0.0282]	[0.0288]	[0.0329]
Zagat Service Rating	-0.0141	0.0555	0.0724
	[0.0495]	[0.0518]	[0.0591]
Zagat Cost (per meal)	-0.00273	-0.00126	-0.00565
	[0.00538]	[0.00423]	[0.00776]
Cuisine Groups [d]			
Standard American Cuisine	-0.557***	-0.470**	-0.341
	[0.201]	[0.199]	[0.216]
European Cuisine	-1.138***	-1.326***	-1.039***
	[0.188]	[0.194]	[0.213]
Asian Cuisine	-1.899***	-1.713***	-2.258***
	[0.357]	[0.361]	[0.551]
Latin American Cuisine	-0.860**	-1.012***	-0.364
	[0.343]	[0.373]	[0.382]
Other Cuisine	-1.194***	-1.030***	-1.136***
	[0.344]	[0.348]	[0.440]
Restaurant Attributes			
Natural/Organic Ingredients Feature	0.324*	0.312*	0.627***
	[0.182]	[0.185]	[0.196]
Winning Wine List Feature	0.0539	-0.0564	0.162
	[0.270]	[0.263]	[0.274]
Total Feature Count [e]	0.0826*	0.0355	0.0329
	[0.0448]	[0.0461]	[0.0512]
Wine Menu Attributes [f]			
Average Total Count of White Wine	0.0104***	0.00726**	0.00303
	[0.00374]	[0.00326]	[0.00325]
Average Total Count of Red Wine	-0.00888***	-0.00517***	-0.00497***
	[0.00189]	[0.00171]	[0.00179]
Average Total Count of Sparkling Wine	0.0245*	0.0212*	0.0209
	[0.0131]	[0.0114]	[0.0130]
Average Total Count of Rosé Wine	-0.0143	-0.00724	0.0118
	[0.0395]	[0.0389]	[0.0407]
Average Total Count of Dessert Wine	0.0520**	0.0445**	0.0319
	[0.0227]	[0.0203]	[0.0195]

Table 5.3 (continued) Logit Regression Results for All NYS Wine, NYS White Wine, and Red NYS Wine

Variable	**All NYS Wines** [a]	**White NYS Wine** [b]	**Red NYS Wines** [c]
Average Total Count of Fortified Wine	0.015	-0.0529	-0.0257
	[0.0459]	[0.0393]	[0.0400]
Average Total Domestic Count	0.0211***	0.00941***	0.0135***
	[0.00356]	[0.00280]	[0.00304]
Regional Attributes [g]			
Upstate New York Location	0.452*	0.636**	0.339
	[0.259]	[0.270]	[0.307]
Manhattan Location	-0.186	-0.0926	-0.103
	[0.226]	[0.241]	[0.278]
Long Island Location	0.980***	1.115***	1.271***
	[0.246]	[0.258]	[0.288]
Constant	-2.638***	-3.477***	-3.770***
	[0.780]	[0.808]	[0.919]
Log Likelihood Ratio	-685.91	-649.38	-545.26
Observations	1,400	1,400	1,400

[a] *The dependent variable in this model is the willingness to buy local white wine, and equals 1 if the restaurant serves any NYS white wine and 0 otherwise.*

[b] *The dependent variable in this model is the willingness to buy local red wine, and equals 1 if the restaurant serves any NYS red wine and 0 otherwise.*

[c] *The dependent variable in this model is the willingness to buy local sparkling wine, and equals 1 if the restaurant serves any NYS sparkling wine and 0 otherwise.*

[d] *Cuisine groups are related to the base case of New American Cuisine.*

[e] *This category does not include the Natural/Organic Ingredients special feature or the Winning Wine List special feature.*

[f] *The counts of wine do not include NYS wines.*

[g] *The regional attributes are related to the base case of the outer boroughs (Bronx, Brooklyn, Staten Island, Queens).*

*Note: Standard errors are in brackets where *** p<0.01, ** p<0.05, * p<0.1*

Table 5.4 Logit Regression Results for NYS Sparkling Wine, Rose Wine, and Dessert Wine

Variable	NYS Sparkling Wine [a]	NYS Rose Wine [b]	Dessert Wine [c]
Zagat Reputation			
Zagat Food Quality Rating	0.0325	0.0609	0.319**
	[0.0951]	[0.0891]	[0.149]
Zagat Décor Rating	0.0958	0.164***	0.11
	[0.0613]	[0.0589]	[0.0999]
Zagat Service Rating	0.0299	-0.280***	-0.2
	[0.111]	[0.102]	[0.167]
Zagat Cost (per meal)	-0.0111	-0.000557	-0.0114
	[0.0132]	[0.00962]	[0.0110]
Cuisine Groups [d]			
Standard American Cuisine	-0.680*	-0.522	-0.272
	[0.371]	[0.363]	[0.569]
European Cuisine	-1.283***	-1.589***	-1.620**
	[0.394]	[0.416]	[0.697]
Latin American Cuisine	-0.851	-1.657	-0.281
	[0.776]	[1.047]	[1.123]
Restaurant Attributes			
Natural/Organic Ingredients Feature	0.486	0.773**	0.246
	[0.329]	[0.329]	[0.522]
Winning Wine List Feature	-0.113	-0.397	0.846
	[0.465]	[0.521]	[0.613]
Total Feature Count [e]	-0.115	-0.105	0.0321
	[0.0953]	[0.0918]	[0.150]
Wine Menu Attributes [f]			
Total Count of White Wine	0.000236	0.00361	-0.00158
	[0.00507]	[0.00444]	[0.00457]
Total Count of Red Wine	-0.00348	-0.00366	-0.00527
	[0.00310]	[0.00312]	[0.00356]
Total Count of Sparkling Wine	-0.0187	0.0288*	-0.00285
	[0.0268]	[0.0174]	[0.0180]
Total Count of Rosé Wine	0.125**	0.121**	0.125*
	[0.0547]	[0.0497]	[0.0726]
Total Count of Dessert Wine	0.0442*	0.0186	0.0898***
	[0.0236]	[0.0273]	[0.0322]
Total Count of Fortified Wine	0.0431	-0.00893	0.158***
	[0.0517]	[0.0538]	[0.0564]
Total Domestic Count	0.00961**	0.00329	0.00729
	[0.00477]	[0.00486]	[0.00527]

Table 5.4 (continued) Logit Regression Results for NYS Sparkling Wine, Rose Wine, and Dessert Wine

Variable	**NYS Sparkling Wine** [a]	**NYS Rose Wine** [b]	**Dessert Wine** [c]
Regional Attributes [g]			
Upstate New York Location	1.161*	-0.111	1.104
	[0.635]	[0.590]	[1.236]
Manhattan Location	0.511	-0.182	1.021
	[0.606]	[0.480]	[1.115]
Long Island Location	1.747***	1.057**	2.039*
	[0.610]	[0.502]	[1.150]
Constant	-5.962***	-1.483	-9.992***
	[1.713]	[1.610]	[3.009]
Log Likelihood Ratio	-201.26	-196.87	-92.38
Observations	1,204	1,204	1,204

[a] *The dependent variable in this model is the willingness to buy local sparkling wine, and equals 1 if the restaurant serves any NYS white wine and 0 otherwise.*

[b] *The dependent variable in this model is the willingness to buy local rosé wine, and equals 1 if the restaurant serves any NYS white wine and 0 otherwise.*

[c] *The dependent variable in this model is the willingness to buy local white wine, and equals 1 if the restaurant serves any NYS dessert wine and 0 otherwise.*

[d] *Cuisine groups are related to the base case of New American Cuisine.*

[e] *This category does not include the Natural/Organic Ingredients special feature or the Winning Wine List special feature.*

[f] *The counts of wine do not include NYS wines.*

[g] *Regional attributes are related to the base case of the outer boroughs (Bronx, Brooklyn, Staten Island, Queens)*

*Note: Standard errors are in brackets where *** p<0.01, ** p<0.05, * p<0.1.*

Table 5.5 Results for Restaurants in the New York City Metropolitan Area

Variable	**Manhattan** [a]	**The Outer Four Boroughs** [a]
Zagat Reputation		
Zagat Food Quality Rating	0.0699	0.218
	[0.0605]	[0.134]
Zagat Décor Rating	0.117***	0.0806
	[0.0435]	[0.0926]
Zagat Service Rating	0.0035	-0.349**
	[0.0736]	[0.146]
Zagat Cost (per meal)	-0.0177*	0.0338
	[0.0100]	[0.0286]
Cuisine Groups [b]		
Standard American Cuisine	-0.0716	-1.148
	[0.320]	[0.731]
European Cuisine	-0.542*	-2.478***
	[0.289]	[0.728]
Asian Cuisine	-0.974**	-2.663**
	[0.456]	[1.308]
Latin American Cuisine	-1.197**	-0.0861
	[0.552]	[0.914]
Other Cuisine	-0.866*	
	[0.457]	
Restaurant Attributes		
Natural/Organic Ingredients Feature	0.169	1.122*
	[0.270]	[0.581]
Winning Wine List Feature	-0.471	0.522
	[0.473]	[1.396]
Total Feature Count [c]	0.0333	-0.0577
	[0.0704]	[0.156]
Wine Menu Attributes [d]		
Total Count of White Wine	0.00908**	0.0354
	[0.00399]	[0.0339]
Total Count of Red Wine	-0.0113***	-0.00906
	[0.00236]	[0.0108]
Total Count of Sparkling Wine	0.0388***	-0.00813
	[0.0146]	[0.0992]
Total Count of Rosé Wine	-0.0647	-0.2
	[0.0542]	[0.132]
Total Count of Dessert Wine	0.0774***	-0.225
	[0.0265]	[0.234]

Table 5.5 (continued) Results for Restaurants in the New York City Metropolitan Area

Variable	**Manhattan** [a]	**The Outer Four Boroughs** [a]
Total Count of Fortified Wine	0.0223	
	[0.0459]	
Total Domestic Count	0.0265***	0.0667**
	[0.00478]	[0.0276]
Constant	-4.432***	-1.355
	[1.188]	[2.800]
Log Likelihood Ratio	-343.64	-61.89
Observations	779	159

[a] *The dependent variable in these model is the willingness to buy local wine for restaurants in Manhattan or the outer boroughs equals 1 if the restaurants serve any NYS wines and 0 otherwise.*
[b] *Cuisine groups are related to the base case of New American Cuisine.*

[c] *This category does not include the Natural/Organic Ingredients special feature or the Winning Wine List special feature.*

[d] *The counts of wine do not include NYS wines.*

*Note: Standard errors are in brackets where *** p<0.01, ** p<0.05, * p<0.1.*

Table 5.6 Results for Restaurants in the Long Island and Upstate New York Areas

Variable	**Long Island** [a]	**Upstate NY** [a]
Zagat Reputation		
Zagat Food Quality Rating	-0.167	-0.053
	[0.116]	[0.125]
Zagat Décor Rating	-0.106	0.122
	[0.0687]	[0.0760]
Zagat Service Rating	0.0758	0.173
	[0.132]	[0.150]
Zagat Cost (per meal)	0.0328	-0.0431
	[0.0215]	[0.0284]
Cuisine Groups [b]		
Standard American Cuisine	-0.232	-1.816***
	[0.476]	[0.498]
European Cuisine	-1.585***	-2.014***
	[0.505]	[0.529]
Asian Cuisine	-2.798**	-3.259***
	[1.123]	[1.158]
Latin American Cuisine	-0.238	-0.326
	[0.935]	[0.906]
Other Cuisine	-0.873	-1.372
	[1.149]	[0.840]
Restaurant Attributes		
Natural/Organic Ingredients Feature	0.591	0.237
	[0.482]	[0.486]
Winning Wine List Feature	-0.254	0.177
	[0.670]	[0.649]
Total Feature Count [c]	0.163	0.197*
	[0.107]	[0.119]
Wine Menu Attributes [d]		
Total Count of White Wine	0.0556**	0.0215
	[0.0259]	[0.0193]
Total Count of Red Wine	0.0244*	-0.00315
	[0.0142]	[0.00888]
Total Count of Sparkling Wine	0.0323	-0.0901
	[0.0633]	[0.0739]
Total Count of Rosé Wine	0.27	0.187
	[0.195]	[0.160]
Total Count of Dessert Wine	-0.023	0.0361
	[0.119]	[0.128]

Table 5.6 (continued) Results for Restaurants in the Long Island and Upstate New York Areas

Variable	**Long Island** [a]	**Upstate NY** [a]
Total Count of Fortified Wine		-1.004
		[1.934]
Total Domestic Count	-0.0385*	0.0187
	[0.0206]	[0.0140]
Constant	1.765	-3.160*
	[1.868]	[1.850]
Log Likelihood Ratio	-127.43	-99.39
Observations	247	200

[a] *The dependent variable in this model is the willingness to buy local wine for restaurants in Long Island or upstate NY, and equals 1 if the restaurants in this location serve any NYS wines and 0 otherwise.*

[b] *Cuisine groups are related to the base case of New American Cuisine.*

[c] *This category does not include the Natural/Organic Ingredients special feature or the Winning Wine List special feature.*

[d] *The counts of wine do not include NYS wines.*

Note: Standard errors are in brackets where *** p<0.01, ** p<0.05, * p<0.1.

CHAPTER 6
CONCLUSION

6.1 Summary

While there has been much work examining final consumers' preferences for local food in the economics literature, there has been little attention focused on intermediate consumer demand for local foods and beverages. Restaurants are an intermediate consumer of foods and beverages, and I argue that the foods and beverages they procure are a very good proxy for the products that final consumers choose to consume. I extend this literature by collecting detailed data on restaurants in NYS to estimate the factors that influence the presence of local wines on restaurant menus by tapping into an underutilized database, the Zagat Survey. I believe this to be a novel and informative source, as it includes standardized scores and additional information for restaurants across a wide range of locations, cuisine styles, and price points. Wine is also an ideal product to explore of restaurant demand for local products because they have well-defined labels on both the bottles and restaurant menus that describe the regions of production. Furthermore, NYS offers an ideal region to consider given the size and rising acclaim of its wine industry.

By building on Lancaster's (1966) consumer theory and RUM framework, I create an empirical model that includes restaurant characteristics (reputation, location, and other attributes) and product characteristics (cuisine style and wine list attributes). Using data from the Zagat Survey, in conjunction with restaurant menu information, I identify 1,530 restaurants that could considered in my analysis. From there, 1,400 restaurants with full Zagat ratings and online wine lists are used to estimate the effect of the selected characteristics have on the offerings of local wines on restaurant menus. This analysis uses information about restaurant demand for wine to also provide insight on how consumers define the term local.

Overall, the results from the baseline model indicate that restaurants' decision to place NYS wines on their wine lists increased with higher Zagat Décor ratings, cuisine styles that are categorized as New American, the Zagat restaurant feature denoted as natural or organic foods, higher counts of white wine, sparkling wine, dessert wine, and domestic wine selections, and the location of the NYS the restaurant. The offerings of NYS wine, however, decreased with the number of red wine products on the menu. The natural or organic feature may act as a signal that a restaurant is more likely to offer local wine when they also offer local food or beverages on their menu. While previous studies indicated otherwise (Preszler and Schmit, 2009), cuisine styles are perhaps the most influential determinant of restaurants' local wine adoption. Across the unrestricted and restricted models, restaurants that offer European or Asian cuisine seem to be the least likely to have a presence of local wine on their menus. The wine list attributes were also important in the baseline model, suggesting that local wine is more likely to be placed on a restaurant menu in NYS when there are many wines that are of a similar style to the wines produced in NYS or when there are many domestic wines present on the menu. Lastly, location appears to matter and the demand for local wine having a limited reach. The probability that a restaurant includes local wine on their menu is greatest in regions that produce wine. Restaurants in Long Island, a region that produces white wines and nearly all the red wines in NYS, are more inclined to offer local white and red wines, but in other regions, the demand for local red wine is not present.

When examining the specification for number and share of local wine on restaurants' menus, similar results are determined as described above. These results indicate that the number of local wines offered in NYS restaurants increased with the Zagat Food Quality rating, Zagat Décor rating, the natural or organic feature, higher counts of sparkling wine, rosé wine, and

dessert wine, and location. The number of NYS wines, however, decreased with the Zagat Service rating, Zagat Cost rating, and cuisine groups. The share of local wines have slightly varying results; for example, higher Zagat Food Quality rating and number of white wines lead to decreases in the share of local wine on restaurants' menus. The higher number of white wines may suggest that restaurants are more willing to procure local wine, but they may not be likely to increase the proportion of local wine on their overall wine list. European and Asian cuisine are also more likely to have a lower number and a lower share of local wines. The wine list attributes, however, show that restaurants are likely to expand the number and share of local wines based on wine styles other than white. Those restaurants located in Long Island are also likely to increase the number and share of local wines on their menus. The proximity of these restaurants to a local wine producing region appear to impact restaurants' likelihood of offering local wine, possibly signaling this narrowly defined idea of local.

Because of the dichotomous relationship between the presence of local wines on menus and the number of white wines and red wines in the baseline results, further analysis was conducted to determine the factors which influence restaurant demand for the various wine styles. Results examining the presence of NYS white wine mirror the results from the baseline specification more closely than the results examining the presence of NYS red wine. The offerings for the other wine styles, sparkling, rosé, and dessert wines were much less similar to the baseline model results. For example, the Zagat ratings had no statistically significant effect on the offerings of local sparkling wine, while different ratings did influence restaurants' demand for local rosé and dessert wine. As in the baseline model, European cuisine was negatively associated with local wine demand across local sparkling, rosé, and dessert wine styles. The natural or organic feature may act as proxy for restaurants to offer NYS rosé but is not important

in the models that examine NYS sparkling or dessert wine. The wine list attributes differ slightly across local sparkling, rosé, and dessert wine. Last, and perhaps the most notable, are the results from the regional attributes. In examining the presence of local white, red, sparkling, rosé, and dessert wines, Long Island restaurants are more likely to offer these local wine styles. Only white wines are more likely to be present in upstate restaurants. Two inferences may be draw from these results. First, the demand for local red wine from Long Island diminishes outside of the Long Island region and, second, those restaurants closer to a local wine producing area may be more likely to adopt local varietals or local styles of wine

Finally, the results from the restricted specifications indicate that determinants for restaurants' demand for local wines differ across regions. Within the Metropolitan NYC area, a higher Zagat Décor score, cuisine styles that are categorized as New American, and higher count of white wine, sparkling wine, and domestic wines increase the presence of local wine on restaurants' menus. For restaurants located in the outer boroughs region of Metropolitan NYC, only restaurants categorized as New American cuisine and the natural or organic Zagat feature increase the presence of NYS wine. The offerings of NYS wine again decrease with the number of red wine offerings on the menu for restaurants located in Manhattan and decrease with the Zagat Service score for restaurants situated in the outer boroughs. The Zagat ratings did not factor into determining the presence of local wine in the models that focused exclusively on Long Island or upstate NY. The New American cuisine styles are shown to increase restaurants' demand for local wine in Long Island and upstate NY. Wine attributes influenced restaurant adoption of local wine in Long Island but not in upstate restaurants. In Long Island, the higher number of offerings of white wine and red wine on a menu increases the presence of local wine,

while a higher count of domestic wine decreases those offerings. These results further provide evidence that local, as defined by restaurants, may be a relatively small geographic area.

6.2 Industry Implications

These results have several important implications for wineries in NYS and emerging production regions in the United States. First, the Zagat ratings, or reputation variables, have consistent effect in the various models, excluding the share of NYS wine on restaurants' wine lists. In particular, the Zagat Décor score is the only reputation variable that is statistically significant across specification. This reputation factor can be seen as an indicator for ambiance and attention to detail and may imply can mean that those restaurant owners who take extra care in crafting the decorations, menus, and overall experience as a way to express their brand, are more likely to place local wines on their menu. The reputation variable for Zagat Food Quality may have a similar effect in expanding the number of local wines. On the contrary, higher Zagat Service scores and a higher Zagat Cost has a negative effect on local wine demand from restaurants.

Second, as was illustrated through the various specifications, the cuisine style also appears to play a large role in restaurants' decision to offer local wine on their menu. Marketers of local wines should consider targeting restaurants with New American cuisine styles with wines that complement the food choices at the restaurant. The results further suggest that NYS restaurants with European or Asian cuisine styles may be the least receptive to local wines. Third, restaurants that offer more white wine in general, or more domestic wines overall, appear to be more likely to include local wine on their menus. Restaurants might also demand more local wines in the sparkling, rosé, and dessert styles. Lastly, restaurant location appears to matter. Restaurants located in Long Island, the predominant region of red wine production in NYS, are

more likely to place NYS red wine on their menu, yet restaurants located in other regions of NYS did not exhibit strong preferences for NYS red wines. Moreover, these restaurants are more likely to list other styles of local wine on their menu while, again, other regions are not. Because of the close proximity to a wine producing region, Long Island restaurants may offer local red wines while other regions are not. Upstate restaurants, by contrast, are only more likely to offer local white wines, which is to be expected given that white wine is the dominate type of wine produced in this region. The demand for local wine in Manhattan restaurants, compared to other regions, is particularly sensitive to reputation factors, Zagat Décor and Zagat Cost rating, and the presence of red wines on their menus. This suggests that the "local" effect is limited geographically and does not expand across a large state like NYS.

6.3 Future Research and Contribution

Further research is needed in order to create a holistic and comprehensive measure of local food systems based on region, consumer, and retailer attributes. The results found in my study indicate that restaurants' demand for local wine is a more narrowly defined geographical region than within state. A possible explanation could be due to the large size of NYS. Restaurants in smaller states may have larger geographical definitions of local products than those restaurants in NYS. In order to examine how state size may affect consumer demand for local products, future research on intermediate consumers can employ a similar analysis as the one conducted in this study. By combining secondary data, such as the Zagat Survey, with primary information on consumers from another state, further understanding can be gained on those factors which influence demand for local products, and provide additional evidence on how those consumers define "local." In the absence of a generalized definition of local foods, a rigorous definition of "local" may be formed from a given set of regional parameters, creating a

possible categorical index for defining what is local. It is clear that more research is needed in order to fully understand consumers' definition of locally produced goods, and which of those consumer attributes influence demand for local products.

The local food movement is a complex and heterogeneous food paradigm which includes many products. Local food may truly be dependent on the locality of consumers, causing the need for varying degrees of what is considered a local product. The findings here contribute specifically to a better understanding of the demand for locally produced wine by NYS restaurants. Key determinants are identified which influence restaurants' demand for local wine, and the results offer useful guidance for industry stakeholders. Moreover, this research provides a novel database and framework for estimating demand for locally produced products by restaurants. This group of intermediate consumers is often overlooked in the agricultural economics literature, yet restaurants purchase a substantial amount of food and beverages in the United States. My results suggest that consumers, if they can be accurately represented by the wine procurement decisions made by restaurants, may have a narrower geographical definition of local than what is presumed by policymakers and food marketers.

END NOTES

[1] According the Oxford English Dictionary, a locavore is "a person whose diet consists only or principally of locally grown or produced food" (2011).

[2] Locapour is a term coined by Molesworth (2011) and has been used to describe a person who makes the conscious choice to consume local wine.

[3] The Zagat Survey is available for all cities containing Zagat Rated Restaurants in NYS and can be found at: www.zagat.com/locations/browse?l=540. I also purchased an annual membership in order to receive access to the Zagat scores and additional details about individual restaurants. For more information about Zagat Survey, see: http://support.google.com/zagat/answer/1705271?hl=en.

[4] Before 2013, a final consumer could become a free member or a paying member; in the latter case, they are able to view the Zagat ratings for all restaurants. During 2013, Google finalized their purchase of the Zagat Survey and incorporated it into their services and this expanded paid member content to all members.

[5] A Member Rated restaurant occurs when a user nominates a restaurant that has not yet been part of a survey. Members are able to review these restaurants, but they do not have a Zagat Rating.

[6] If an average cost per meal cannot be appraised, one of the following categories is used to indicate the price range: Inexpensive (I), Moderate (M), Expensive (E), and Very Expensive (VE), with each level representing a price range.

[7] Of the 1,530 Zagat-rated restaurants in NYS with wine lists available online, 848 were in Manhattan and 198 were in the outer boroughs. Additionally, of the 1,400 restaurants used in the analysis, 779 were from Manhattan and 159 were in the four outer boroughs.

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